



Consultation Report

**Healthy Environments for Children Alliance
Inter-regional Consultation**

***Improving Children's Environmental Health in Settings
Experiences and lessons for policies and action***

**Imperial Resort Beach Hotel
Entebbe, Uganda
29 November - 2 December 2005**

Background to the Consultation

The Healthy Environments for Children Alliance (HECA) was inaugurated in September 2002 at the World Summit on Sustainable Development (WSSD) by WHO in partnership with key stakeholders in children's environmental health. HECA is a world-wide alliance to reduce environmental risks to children's health that arise from the settings where they live, learn, play and sometimes work, by providing knowledge, increasing political will, mobilizing resources, and catalysing intense and urgent action. HECA is an essential contribution to the realization of the health, environment and poverty components of the Millennium Development Goals (MDGs).

The work of HECA focuses on actions to tackle the six groups of environment and health issues that constitute the majority of the global burden of disease among children ages 0-14. These are: household water security; hygiene and sanitation; air pollution (including indoor air pollution and environmental tobacco smoke); vector-borne diseases (e.g. malaria); chemical hazards (e.g. lead and unsafe use of pesticides); and unintentional injuries or accidents.

An essential element in the work of HECA is country and community-level support. Alliance stakeholders aim to encourage a groundswell of action through many sectors who work together to initiate national and local movements, and build national and local capacities to create and maintain healthy environment for children. Pilot projects are used as the basis for developing healthy environments for children programmes/projects and to demonstrate different ways through which risks to children's health and the environment can be addressed. With funds from the government of the Netherlands, HECA is currently supporting 16 projects in 13 countries covering five WHO regions.

In order to maximize efforts to address environmental risks to children's health, HECA works in partnership with a number of other health and sustainable development partnerships including: the Global Initiative on Children's Environmental Health Indicators (CEHI); the Health and Environment Linkages Initiative (HELI); and the International Network to Promote Household Water Treatment and Safe Storage, as well as initiatives in different regions and countries to develop national profiles of children's environmental health and to train health providers in identifying and managing children's environmental health issues.

Objectives and participants

An inter-regional consultation on "Improving Children's Environmental Health in Settings - Experiences and lessons for policies and action" was held in Entebbe, Uganda from 29 November to 2 December 2005 with the aim of identifying and capitalizing on the strengths of settings-based action to address environmental risks to children's health.

The specific objectives of the meeting were to:

- Examine the evidence that demonstrates that settings-based interventions have positive outcomes for CEH
- Share experiences in addressing CEH in settings;
- Pull out lessons to be learnt: What works? What doesn't? How can we overcome obstacles?
- Make Linkages between initiatives and network for synergized efforts.
- Make linkages between different healthy environments for children-related initiatives to maximize benefits and synergize efforts (CEH national profiles, CEH training of health providers, the Global Initiative on Children's Environmental Health Indicators(CEHI); the Health and Environment Linkages Initiative (HELI); and the International Network to Promote Household Water Treatment and Safe Storage.

Participants in the consultation represented healthy environments for children's initiatives and other initiatives to address children's environmental health issues, from five regions of WHO: African region (Central African Republic, Kenya, Rwanda, Uganda); Region of the Americas (Nicaragua); Eastern Mediterranean Region (Pakistan/Yemen); South-east Asian region (India); Western Pacific region (Samoa). Participants came from a variety of governmental sectors, non-governmental organizations, civil society and the private sector. WHO was represented from Headquarters, regional and national levels, as well as from the WHO Regional Center for Environment and Health Activities (CEHA) in Jordan.

See Annex 2 for a full list of participants.

Opening Session

The opening session was conducted by Dr Paul Luyima, Assistant Commissioner, Environmental Health Division, Ministry of Health, Uganda. Dignitaries at the opening session included Dr Melville George, WHO Representative, Uganda and Dr Lawrence Kaggwa, Director of Health Services in charge of planning and development, Ministry of Health, Uganda.

On behalf of the World Health Organization, Dr George welcomed participants and thanked the Government of Uganda for hosting the meeting, and the Government of the Netherlands for supporting the consultation and the HECA-supported projects around the world. He highlighted that children around the world today confront more environmental hazards than at any other time. In developing countries children still face traditional threats from unsafe water, poor sanitation, indoor air pollution and vector-borne diseases. At the same time they increasingly face new problems such as exposure to toxic chemicals. The WHO representative outlined the ways in which children are more vulnerable than adults to environmental hazards and called attention to the need to focus on children and protect them from exposure to environmental risks to their health by

involving all those responsible for their health and well-being. He underscored that health professionals have a responsibility for initiating the process that will end in links between different actors to foster and promote healthy environments for children. Dr George called on participants to share their examples of good practices, working experiences and innovative approaches that would make the difference in achieving the environment-related Millennium Development Goals and inform policy and action for ensuring healthier environments for children.

Speaking for the Honourable Minister of Health, Rtd. Major General Jim Muhwezi, Dr Lawrence Kaggwa welcomed participants on behalf of the Government of Uganda. Child health is one of the priority areas of Uganda's broad plan for socio-economic development and children's environmental health is seen as a very important development milestone in the health and socio-economic status of the country. Dr Kaggwa highlighted the relationship between poor child health and inadequate sanitation as underscoring the Government of Uganda's prioritization of sanitation in the Health Sector Strategic Plan (HSSP) and a gauge of their commitment to achieving the MDG targets. He underscored that effective action must be multisectoral and requires advocacy and social mobilization. The HECA pilot project in Masindi District is based on these principles and aligns itself with the strengths of Uganda's HSSP which: 1) is based on a situation analysis of the burden of disease; 2) is realistic; 3) is community-based and focuses on primary health care, public education and information.

Dr Kaggwa appealed to participants to maximize from the huge potential that exists in using a multisectoral settings approach to address environmental risks to children's health. Action to be taken include:

- Using the settings approach which is potentially cost-effective as a means to influence policy to address evidence-based health priorities.
- Seizing every opportunity to talk to children and youths.
- Empowering children to improve on the environment in institutions, families and communities at large.
- Providing HIV prevention and care for those affected by HIV/AIDS.
- Building and strengthening capacity for effective implementation.
- Documenting processes and sharing information at all levels.

The representative of the Ministry of Health thanked the World Health Organization and the Healthy Environments for Children Alliance for organizing the consultation and choosing Uganda as the host country. On behalf of the Government of Uganda Dr Kaggwa declared the conference open and wished the participants fruitful deliberations.

(Opening address)

(All presentations are available for download at:
<http://www.who.int/heca/activities/entebbe/en/index.html>)

Mrs Catherine Mulholland, Technical Officer, Healthy Environments for Children Alliance Secretariat, World Health Organization, and Hawa Senkoro, Regional Adviser, Healthy Settings and Children's Environmental Health, World Health Organization Regional Office for Africa, gave an overview of work on healthy environments for children at global and regional levels.

The purpose of the presentation on the Healthy Environments for Children Alliance at global level was threefold: 1) to show how children's environmental health (CEH) issues are at the heart of sustainable development; 2) to present the Healthy Environments for Children Alliance (HECA) and its work to participants; 3) to present the HECA pilot projects.

The presentation demonstrated how health is an essential input to and an outcome of sustainable development. It highlighted the fact that children's environmental health is an indicator of the quality of development.

The HECA presentation outlined why a global alliance was needed, what HECA has accomplished to date, and the current focus on country level work. The thrust at country level comes from the 16 pilot projects in 13 countries in all regions. Background was given on the pilot projects, as well as an overall profile of the projects in terms of the range of sector/actors that are spearheading the projects, as well as the kinds of activities being undertaken in different places. The outcomes of the pilot projects will be used to move forward with and scale-up HECA and other similar projects and programmes, and to strengthen the healthy environments for children agenda in regions and countries.

(Presentation 1)

The presentation on healthy settings and children's environmental health in the African region aimed at:

1. providing an overview of the "healthy settings" approach and ongoing efforts in the region to promote the approach;
2. showing the value of the health settings approach in addressing environmental risks to children's health that arise in the settings where they spend their time.

Mrs Senkoro highlighted that the healthy settings approach has developed over the last 17 years and has now been applied to many settings such as cities, towns, villages, islands, homes, schools, health facilities, marketplaces, workplaces and neighbourhoods.

Settings-based approaches have proven to be effective in:

- facilitating participation and cooperation of all stakeholders;
- providing mechanisms for communities to organize themselves and form partnerships to address health and environment issues;
- allowing key priorities to be addressed and generating local action;
- helping to put programmes needed for better health into operation.

The Regional Office for Africa of the World Health Organization (AFRO) supports and promotes healthy settings initiatives by: offering technical support; organizing and promoting regional and sub-regional meetings; producing resource materials; supporting the development of pilot projects.

The settings approach has been adopted in the region for promoting healthy environments for children. AFRO will continue to support Member States in strengthening healthy settings to address environmental risks to children's health through: building political will; promoting effective actions and policies; facilitating networking and information sharing; providing technical support and assisting in the development of pilot projects; mobilizing national and external resources.

(Presentation 2)

Organization and method of work

The programme for the meeting was constructed around a number of theme areas designed to maximize information exchange and highlight lessons and practices that could be of use to programmes and projects interested in addressing children's environmental health issues in settings. See Annex 1 for the full programme.

The theme areas were:

- Effectiveness of settings-based action in addressing environmental risks to children's health.
- Building the evidence base on effective interventions for CEH (indicators, monitoring and evaluation of settings-based interventions).
- Good practices in addressing environmental risks to children's health in settings.
- Identifying and capitalizing on the strengths of settings-based action to address children's environmental health.
- Building capacity and building strength through linkages.

The method of work of the meeting consisted of:

- Plenary sessions followed by discussions to ensure maximum participation and intellectual exchange between participants.
- Working group sessions to ensure identification of key lessons learnt for good practise for addressing environmental risks to children's health and strengths of settings based actions.
- Field visits to ongoing projects to see/ learn from what is actually happening at the ground for adaptation and application in different contexts.

- Interactive workshops to further knowledge transfer and exchange and build capacity.
- The Healthy Environments for Children "Open Forum" where participants shared information on their projects/initiatives and engaged in in-depth discussions with other participants using a variety of media (poster exhibitions, demonstrations, films, print materials, CD ROMs...).

A summary of discussions and key outcomes and recommendations in each theme area follows.

Theme One - Effectiveness of settings-based action in addressing environmental risks to children's health

A working draft of the paper "Settings-based initiatives to address environmental risks to children's health - What works?" was tabled at the consultation as a work in progress. It is aimed at bringing together the best current knowledge gained from interventions to address environmental risks to children's health. It reviews:

- What works.
- The essential elements of interventions.
- How settings-based approaches can be used to their best advantage to improve children's environmental health.

See Annex 3 for the draft work in progress as tabled at the consultation.

(Presentation 3)

Participants welcomed the work in progress, committed themselves to provide feedback and comments, as well as inputs to fill in gaps, strengthen and enhance the paper. They supported a wide consultative process, including regional consultation and recommended the inclusion of some of the lessons learnt, and experiences which had come out during the consultation. It was further recommended that the paper constitute one of the outputs of the HECA consultation along with the report.

Theme Two - Building the evidence base on effective interventions for children's environmental health (indicators, monitoring and evaluation of settings-based interventions)

Theme Two was introduced by Ms Fiona Gore, Technical Officer, Global Children's Environmental Health Indicators, World Health Organization.

The objective of the presentation was to emphasize the importance of information and data collection and the necessity to monitor children's environmental health using indicators to reduce the environmental health burden on children. Monitoring trends in children's environmental health allows us to:

- identify of potential risks to children's health;
- target action;
- highlight information gaps;
- evaluate the effectiveness of interventions;
- assess the effects of policies;
- help guide policy.

Steps involved in developing indicators were described and the type of information needed to construct was outlined. The MEME (Multiple Exposures - Multiple Effects) model was presented as an appropriate framework for embedding CEH indicators, providing the conceptual and theoretical basis for the development, collection and use of children's environmental health indicator and helping us to be more systematic in defining the issues that confront us, and in analyzing and interpreting them. Finally, a few concrete examples were illustrated to enable a clear understanding of how indicators are used and what we are aiming towards with the context of the Global Initiative on Children's Environmental Health Indicators.

(Presentation 4)

Work on Theme Two continued in small group sessions. Each of the three breakout groups was facilitated in working with identifying and using children's environmental health indicators to monitor projects and evaluate progress. Among the questions guiding discussions in the small groups were:

- What environmental health priorities affecting children were addressed in your project?
- How were these priorities defined?
- Do you consider your project to be successful?
- Why was it successful and what aspects made it successful?
- How was the success evaluated?
- What measures were used?
- Has your project made use of indicators?
- Were indicators used to monitor and/or evaluate progress/outcomes?

The following recommendations were made on Theme Two.

With regard to stakeholders/actors/beneficiaries:

- Involve all actors in choosing indicators, monitoring and evaluation of projects.
- Involve communities and beneficiaries (including children) in the planning and practice of monitoring and evaluation.
- Increase understanding of importance and benefits of monitoring for evaluation of progress and effectiveness of interventions.

With regard to building capacity:

- Use partnerships and training to overcome lack of technical know-how and equipment and poor data sources (record-keeping).
- Undertake joint planning and implementation to address lack of health information systems.

Theme Three - Good practices in addressing environmental risks to children's health in settings

Theme Three was introduced by Mr Bruce Gordon, Technical Officer, Healthy Environments for Children and Water, Sanitation and Hygiene, World Health Organization. Mr Gordon cautioned that while settings-approaches offered a flexible and inclusive platform for implementation, the challenge lay in translating this into effective and prioritized interventions. He then laid out elements of good practice noting the need to build effective partnerships from the outset, as well as agreeing on an initial focus for implementation. The issue of choosing effective, cost-effective, acceptable, and scaleable interventions was stressed drawing on examples from household water management issues. Finally, he acknowledged that addressing multiple risks was difficult and that even by tackling two risks, household water and air quality, huge health gains could be made.

(Presentation 5)

This introduction was followed by a case study on good practices in ensuring interventions reach children by Ms Muna Shalita, Safe Water Program Manager, Population Services International (PSI), Uganda. She explained PSI philosophy in selling, but not giving away products/services at affordable prices, because they would be more highly valued and better used by consumers, they would provide a profit incentive to distributors and retailers to ensure availability, and the cost recovery aspect would enhance program sustainability. She emphasized how communications through midwives, nurses, and women's groups was effective at reaching children. Ms Shalita's presentation drew upon her experience leading work on interpersonal communication sessions called, "Under the Mango Tree" campaign, to emphasize how child-focused interventions can address multiple risks to children's health. She pointed out how it made sense to combine health messages on malaria and safe water given the almost identical audiences. She summarized PSI's social marketing campaign for household water treatment which includes a combined flocculation disinfection product, PUR, and a dilute sodium hypochlorite product WaterGuard. She stressed that it was important for audiences to see for themselves how products like PUR clarify previously turbid water, giving a visible indicator of efficacy.

(Presentation 6)

Discussions that followed brought out the following issues and challenges. A number of these highlight how existing opportunities can be used to address multiple risk factors and/or link health activities with broader development/poverty reduction activities.

- How to balance private enterprise with meeting the needs of poor people. This included discussion on around the debates on whether to provide goods and services free to poor people versus charging nominal fees to ensure that the good or service is "valued".
- How PSI is addressing HIV/AIDS issues in its activities. PSI and the Centres for Disease Control (CDC) are collaborating on a basic care package to encourage recently diagnosed HIV-positive people to live positively and reap the health benefits from safe water. The basic care package includes an insecticide-treated bednet, condoms, a year's supply of "WaterGuard" (a point of use water treatment technology), and a safe storage vessel for storing treated water.
- Possibilities for linking activities already underway and the demand for goods created to producing and marketing some of these goods locally as productive employment-creating enterprises.

Theme Three continued a Day Two with a number of case study presentations that served as "thought starters" for the small group work on good practices in addressing environmental risks to children's health.

The first case study presented by Mrs Catherine Mwangi, Executive Director, Kenya Water for Health Organization (KWAHO), looked at the challenging environments where children live, highlighting the prevalence of water and sanitation-related diseases and scarcity of basic amenities. She summarized KWAHO's participatory approach to minimize these risks, with community members and other stakeholders developing a project plan. A successful strategy placed children at the centre, using school pupils as change agents, who delivered hygiene, sanitation, and household drinking water disinfection practices and messages, learnt in the classroom, to their families and to the wider community. She highlighted how poems and drama performed by teachers, was an effective means of "reaching" children, and that sustainability could be achieved more readily using low-cost, locally available materials, like the PET bottles used for solar water disinfection.

(Presentation 7)

The second case study presented by Dr M.Z. Ali Khan, Director, WHO Regional Centre for Environmental Health Activities (CEHA) brought out how addressing children's environmental health issues can be embedded within existing settings-based initiatives in regions and countries and therefore both benefit from, as well as enhance longstanding initiatives that have proven their successfulness. The "Healthy and Safe School Environment for Children" projects in Pakistan and Yemen were used to illustrate how local schools, communities, municipalities, NGOs and parental organizations can be mobilized to make school environments healthier and safer.

The objective of the projects is to create healthy and safe school environments for children through promoting community-based action. This is done by:

- Raising awareness among the general public on the impact of the school environment on children's health and development, as well as on the well-being of the larger community.
- Encouraging participation by bringing together all concerned parties.
- Empowering involved partners to carry out self evaluation and monitoring of the school environment to maintain and sustain improvements.
- Encouraging healthy competition among schools to improve and maintain their physical environment.

These projects are integrated with the long-standing and successful "Basic Development Needs" (BDN) community-based initiatives in the two countries. Dr Khan presented the Basic Development Needs Programme concept as integrated socio-economic development, aimed at achieving better quality of life through self-reliance and self-management whereby the community actively participates in the development process and is supported through coordinated inter-sectoral actions. By piggybacking on existing community-based and/or settings initiatives such as the BDN and healthy villages in the Eastern Mediterranean region (established in 13 countries since the early 1980's), healthy environments for children initiatives can benefit from existing intersectoral structures and mechanisms, established joint partnerships between sectors and actors, lessons learnt from settings-based initiatives. Healthy environments for children are embedded within approaches that emphasis participatory, bottom-up action, community ownership and empowerment and improvement in quality of life. In return, the existing community-based initiatives benefit from the focus on preventing environmental risks to children's health which very often represent a considerable, but often easily avoidable, disease risk in the community.

(Presentation 8)

In the third case study Mr Sam Ombeki of CARE International presented the Safe Water System School Project in Kenya highlighting the need for low-cost interventions to protect the health of beneficiaries and non-beneficiaries of "improved" water sources, which is the indicator used to measure progress for MDG Goal 7 target 10. In particular he stressed how the "Safe Water System" which consists of point-of-use drinking water disinfection with dilute sodium hypochlorite, combined with safe storage, and supported by behaviour change interventions, has demonstrated ability to significantly reduce diarrhoeal disease. The focus of his discussion related to the HECA-funded Rangwe school pilot project, which has resulted in major diarrhoeal reductions and cost-savings. Initial results have convinced other donors to contribute, including Coca-Cola, to support scale-up activities to 60 schools. Early evidence suggests successful behaviour change by pupils, parents and teachers.

(Presentation 9)

The fourth case study, presented by Mr Rakesh K. Jaiswal, Executive Secretary, Eco Friends concentrated on the issue of mobilizing communities to address the effects on children's health of toxic chemicals as illustrated by the HECA-supported project

"Environmental Improvement Programme for the Children of Pollution-affected Jajmau and Noraiakheda area of Kanpur, India".

The communities in the project area face an acute problem of surface and groundwater pollution with toxic chemicals as a result of the industries (primarily leather tanning industry) operating in the area with few, if any, environmental controls. Where controls exist on paper, they are most often not respected and rarely challenged by local authorities as the polluting industries are at the base of the local economy.

The problem was described in the following terms supported by numerous photos giving pictorial evidence of the acute nature of toxic pollution and its effects.

- Toxic wastewater (sewage mixed with tannery effluent) is being used for irrigating 2500 hectares of farmland.
- Piles of hazardous tannery sludge are dumped indiscriminately along the road leading to villages.
- Wastewater is reported to be highly contaminated with chromium, arsenic, lead, mercury, cadmium and other toxic substances.
- Residents of Noraiakheda (approximately 10,000) are drinking water contaminated with the known carcinogen, chromium as a result of indiscriminate disposal of waste from chrome tanning units of leather industry.
- No access to safe water, poor sanitation and hygiene in project communities.
- Resulting health problems include: rashes, boils, papules, vesicles, eczema, ring worm, white spots, blisters, decay of nails, advanced stages of leprosy, numbness of limbs.

Project activities being undertaken by Eco-Friends include:

- Survey and rapid assessment.
- Water quality tests.
- Meetings, protests and rallies.
- Awareness-raising and advocacy activities: village-to-village awareness-raising campaigns; workshops and public hearings, letter-writing campaigns to authorities at different levels; education programmes; media campaigns.

Among the achievements to date have been the following:

- Establishment of a Multi-stakeholder Action Group.
- Judicial intervention.
- Chrome recovery plans set up in 88 chrome tanning leather units of Kanpur and establishment of common chrome recovery plan for 110 small units in progress.
- Two deep tube wells sunk to bring safe drinking water to 14 villages.
- Occasional health check up camps established.
- Ground water remediation project in progress in Noraiakheda.
- Scientific landfill site for safe disposal of tannery sludge in progress.

In addition to these achievements, the project has also contributed to overall developmental improvements for the communities concerned such as road construction and electrification of villages, as well as an increase in awareness and political activity among the communities.

(Presentation 10)

Work on Theme Three continued on Day Two in small group sessions. Each breakout group considered the following issue areas in their work:

- 1) How to address multiple risks and how to embed/piggyback-on settings-based approaches.
- 2) How to involve different groups (including children), increase ownership, participation, responsibility and resources.
- 3) Communication - how to get information into settings, raise and sustain awareness.

In the report backs from breakout groups and subsequent discussions, there were many good practices identified and options for interventions which broadened the scope of actions that might be undertaken in interventions to address CEH in settings. Some of the key conclusions and recommendations were as follows:

Addressing multiple risks, using established settings and other established initiatives

- Use a single issue as an entry point and build on to address multiple risks.
- Ensure community participation in identification of priority CEH risks.
- "Piggyback" on what is already underway (pregnant women receiving info on safe water AND malaria).
- Develop IEC materials aimed at convincing Healthy Settings implementers of the benefits (health and cost) of addressing CEH.
- Don't overlook the social aspects that are critical in effectively addressing CEH issues.

Involvement, participation, ownership, responsibility

- Identify effective change agents (community leaders, children, teachers, health care workers) and involve them from project inception.
- Identify KEY stakeholders and partners, get them involved and keep them involved (give them recognition).
- Hold regular stakeholder meetings to review roles and responsibilities and delivery.
- Use established and effective participatory tools and methodologies (PHAST).

Communication - getting information into and between settings, raising and sustaining awareness

- Use drama, songs, music to seed behaviour change
- Capitalize on existing communication channels (use the mango tree)
- Get to know and use the power of communication tools and techniques (behaviour change communication techniques, BCC)

Key elements in sustainability were also highlighted by participants. These include:

- ✓ Ownership
- ✓ Integration into current systems/practices
- ✓ Capacity-building, skills/knowledge transfer
- ✓ Participation

A lesson learnt from the consultation was that sustainability can be built into community practice such as through the production and distribution of goods, products and services by the community itself to reduce reliance on outside resources.

In order for the consultant participants to continue learning from one another, share good practices and innovative approaches, as well as challenges faced and ways of overcoming these, an "Open Forum" of projects and initiatives to create healthier environments for children was organized on the evening of Day Two. Using a variety of media including poster exhibitions, print materials, demonstrations, CD ROMs, films, videos and DVDs, participants were able to exchange information, knowledge and practices.

Among the initiatives featured were:

Central African Republic - poster exhibition and film on the initiative "Ecole propre, école verte, école en santé".

Nicaragua - print materials and CD Rom on "Healthy Environments for Children in Nicaragua".

India - films on "Environmental Improvement Programme for the Children of Pollution-affected Jajmau and Noraiakheda area of Kanpur, India".

Uganda - poster exhibition by the WERA Development Association on "Support to Children's Environmental Health Programmes in Teso Sub-region, Uganda".

Population Services International (PSI), Uganda - film on "Under the Mango Tree" initiative and demonstration of PUR point of use water treatment technology.

Uganda - video on "Awareness-raising and Advocacy for Sanitation Improvement in Kiryandongo Sub-county, Masindi District".

Theme Four - Identifying and capitalizing on the strengths of settings-based action to address children's environmental health

A site visit was organized to Masindi District where a healthy environments for children initiative is in its initial phase of implementation. The title of the project is "Awareness-raising and Advocacy for Sanitation Improvement in Kiryandongo Sub-county, Masindi District".

The project and site visit were introduced by Mr Collins Mwesigye, National Programme Officer, WHO Country Office, Uganda. In his presentation Mr Mwesigye outlined the objectives of the project for participants. These are as follows:

- Sensitize political leaders on the losses that accrue from poor sanitation using the SAN-WEALTH approach.
- Build capacity of Environmental Health workers to use the SAN-WEALTH tool.

The environmental risk factors to children's health being addressed by the project are: safe excreta disposal; safe water; hand-washing; indoor air pollution from smoke; and road safety which was added. It is expected that the project will result in overall improved environmental health conditions with a reduction in diarrhoeal diseases, respiratory tract infections and worm infections among children.

Project targets to address these risk factors are as follows:

- Increase safe excreta disposal by 40%.
- Increase safe water handling by 50% through promotion of a safe water chain.
- Increase hand washing by 50%.
- Improve housing conditions by 40%, targeting the avoidance of indoor smoke.

The presentation highlighted the SAN-WEALTH tool being used by the project to raise awareness and educate the public on the economic losses that accrue from poor sanitation. The approach and tool are modeled on the Participatory Hygiene and Sanitation Transformation (PHAST) tool and has demonstrated its usefulness in moving communities from knowledge to action.

The settings for project activities are homes and schools and these are being accessed through community leaders and schools leadership system. The project is targeting 40 primary schools with a population of 26,844 pupils and 1520 households of community leaders in the first instance with plans to roll out to the rest of the sub-county subsequently. To date project activities have covered:

- Training of environmental health and community development staff in the use of the SAN-WEALTH tool.
- Sensitization of political and civic leaders using the SAN-WEALTH approach.
- Development of a plan to help promote sanitation in Kiryandongo sub-county.
- Carrying out of baseline studies in households of local council leaders and 40 primary schools.

Outcomes from project activities to date include:

- Sensitized political leaders appreciate economic burden of poor sanitation and have started improving sanitation in their homes.

- Schools have started to put in place facilities for improving sanitation and engaging children to improve hygiene.
- School heads have written circular letters to parents about the project and engaging parents by requesting them to improve sanitation at home.

(Presentation 11)

Participants felt that the site visit had been particularly useful in grounding the discussions at the consultation in the reality of what is faced by communities in resource-poor settings. It is essential that this reality is taken into account when planning, implementing, and monitoring progress and outcomes of interventions to address children's environmental health in settings.

Some conclusions and recommendations arising from the site visit and subsequent discussions included:

- Use an integrated approach to address health, risk factors and determinants of health.
- Adopt a "settings-to-settings" approach to ensure that multiple risks are addressed and to encourage participation and ownership among beneficiaries and communities.
- Emphasize processes to improve health, increase community participation, ownership and reliance on their own resources.
- Involve key stakeholders and emphasize that CEH is everybody's business and everybody stands to benefit.
- Use the power of enforcement measures in e.g. water and sanitation.
- Establish and/or strengthen local committees to integrate inputs from stakeholders.
- Look into different mechanisms and options to address water scarcity and adapt to local situations.
- Use barriers and/or fencing to discourage encroachment on school grounds.
- Establish incentive programmes to encourage participation and results (e.g. competitions between schools).
- Improve on operational maintenance, paying due attention to participation and ownership issues.
- Maximize possible partnerships (including private/business sector).

It was also highlighted that settings-based approaches to addressing CEH issues need to be flexible and adaptable so that they may respond to country-specific contexts, as well as different priorities and needs of communities.

In subsequent discussions participants highlighted the question of resource mobilization. This was considered alongside the considerations of what HECA is and what it can do. Participants recognized that HECA exists at global, regional, country and local levels. It can be used to exercise power in different ways such as:

- a rallying point (recognized name);

- a convener;
- the hub of a network that includes governmental, non-governmental, civil society, academia and private sector entities;
- a means to draw interest from other sectors as it is not identified with any one sector.

HECA is an alliance owned by all and the power of HECA can be harnessed by all in different ways. Participants highlighted that it is important to see HECA in local terms. In this spirit one participant announced his intention to launch a local HECA in his community.

Theme Five - Building capacity and building strength through linkages

Three interactive workshops were organized to further knowledge transfer and exchange and build capacity.

1. How to network and link up and how to tap into information and financial resources for children's environmental health

The intent of this session was to seed discussion on practical ways to access additional resources, financial, human, and informational to support children's environmental work. Participants stressed that, this "networking" capability, was critical, and felt that this was precisely the rationale for HECA being maintained and strengthened. In conclusion, it was felt that HECA leadership was essential to share innovative best practices and capture diverse experiences.

2. The Global Initiative on Children's Environmental Health Indicators

The learning objectives of this interactive session included:

- Recognizing and understanding the importance of the use of children's environmental health indicators.
- Reviewing the basic indicators available (exposure, health outcomes, actions) using the MEME model framework.
- Developing the capacity and expertise to develop, collect and monitor the trends of children's environmental health through the use of indicators.
- Considering when, where and how to monitor the environmental health of children.

The process of initiating an indicator pilot was described and the various on-going pilot projects were presented from the Global Initiative on Children's Environmental Health

Indicators launched at the World Summit on Sustainable Development in 2002¹, highlighting the different approaches used in different regions of the world. Specifically, the Eastern Mediterranean (Oman and Tunisia), the North American (Canada, Mexico and the United States) and the European region pilot projects were illustrated and initial lessons learnt were emphasized and thereafter discussed.

(Presentation 12)

3. National children's environmental health profiles. What are they? How to undertake one? Models from the African and Latin American regions

The purpose of the workshop was to discuss National Children's Environmental Health Profiles - Why and how to undertaken profiles. The aim was to inspire participants to consider undertaking National Profiles on Children Environmental Health upon return to their respective countries/institutions

During discussion the National Profiles were describe as qualitative reports in nature that describe and analyse the current situation of the country on different aspects of public health from the perspective of environmental and chemical threats to the health of children. The purpose of the profile is to serve as a baseline assessment that can be used by policy-makers in priority setting and planning of environmental health interventions targeted at improving children's environmental health.

The process followed to undertake National Children's Environmental Health Profiles in 12 countries in WHO/AFRO was described. Lessons learnt and some challenges in preparing profiles were highlighted using Kenya's experience.

Participants acknowledged that preparation of profiles constituted a first important step in the process of developing programmes and initiatives to address children's environmental health issues.

(Presentation 13)

Next Steps

The outcome will be used to move forward with HECA and other similar projects/programmes aimed at improving children's environmental health and using this to replicate and/or scale up.

Follow up steps will include:

¹ For more information: www.who.int/ceh/indicators

- Use lessons learnt and good practices to inform project implementation in countries
- Use advocacy and communications to convince others. Spread the word.
- Use the strengths of settings-based approaches to CEH issues to solicit support and resources from donors and "like-minded parties". Identify and maximize the use of available resources
- Continue to build capacity through knowledge transfer and training at all levels for key stakeholders and partners
- Build strength through linkages.

Build HECA by building the HECA family

Annex 1

Programme

**HECA Inter-regional Consultation
Improving Children's Environmental Health in Settings
Experiences and lessons for policies and action**

*Imperial Resort Beach Hotel
Entebbe, Uganda
29 November - 2 December 2005*

Monday, 28 November 2005

Arrival of participants and registration

Tuesday, 29 November 2005

Opening Plenary Session

Master of Ceremonies - Dr Paul Luyima, Assistant Commissioner, Environmental Health Division, Ministry of Health, Uganda

8h45-9h30 Introductory session

Objectives of the meeting, agreement on the agenda, presentation of method of work, administrative issues

- *Mrs Hawa Senkoro, WHO Regional Office for Africa (AFRO)*
- *Mr Collins Mwesigye, WHO Country Office, Uganda*

Healthy Environments for Children - overview of work at global level and in the African region

- *Mrs Catherine Mulholland, Healthy Environments for Children Secretariat, WHO/HQ*
- *Mrs Hawa Senkoro, AFRO*

9h30-10h00 Opening session

Welcoming remarks

Dr Melville George, WHO representative, Uganda

Opening address and official opening of consultation

Dr Lawrence Kaggwa, Director of Health Services in charge of Planning and Development, Ministry of Health, Uganda on behalf of the Honourable Minister of Health

10h00-10h15 Coffee break

10h15-10h30 Introduction of participants

Plenary Session

10h30-11h45 Theme one - Effectiveness of settings-based action in addressing environmental risks to children's health

(Draft paper circulated to participants and presentation and discussion moved to Friday 2 December plenary session)

Presentation of background document

- *Mrs Catherine Mulholland, WHO/HQ*

Plenary discussion on the effectiveness of settings-based action to address environmental risks to children's health

Plenary session

11h45-12h30 Theme two - Building the evidence base on effective interventions for CEH (indicators, monitoring and evaluation of settings-based interventions)

Presentation on Children's Environmental Health indicators - What are they? How to use them? Using indicators to track progress and evaluate outcomes.

- *Ms Fiona Gore, WHO/HQ*

Organization of breakout group work for the afternoon

12h30-14h00 Lunch break

Breakout groups

14h00-15h15 Work in breakout groups (3 groups) on using CEH indicator profiles to monitor progress and evaluate outcomes.

15h15-15h30 Tea break

Plenary Session

15h30-16h15 Report backs from breakout groups and drawing out recommendations for building the evidence base (10 minutes per group plus 15 minutes discussion)

16h15-16h45 Introduction to theme three - Good practices in addressing environmental risks to children's health in settings

Presentation on identifying good practices

- *Mr Bruce Gordon, WHO/HQ*

Case study presentation on good practices in ensuring interventions reach children

- *Ms Muna Shalita, PSI Uganda*

Plenary discussion

Summary of Day One (Chair)

Homework for the evening and organization of breakout group work for Day Two

19h30 Evening reception (Botanical Beach Hotel)

DAY TWO

Wednesday 30 November 2005

Theme three continued - Breakout group work on good practices in addressing environmental risks to children's health in settings

Plenary Session

8h30-9h30 Presentation of case study examples as thought starters for breakout groups

Case Study 1 - Kenya Water for Health Organisation (KWAHO) project in Kenya, Mrs Catherine Mwangi, Executive Director, KWAHO

Case Study 2 - Creating Healthy and Safe School Environments in Pakistan and Yemen, Dr M.Z. Ali Khan, Director, CEHA

Case Study 3 - The Safe Water System School Project in Kenya, Mr Sam Ombeki, CARE International, Project Manager, Kenya

Case Study 4 - Environmental Improvement Programme for the Children of pollution-affected Jajmau and Noraiakheda area of Kanpur, India, Mr Rakesh K. Jaiswal, Executive Secretary, Eco Friends

Breakout groups

- 9h30-10h45** Breakout group work on good practices in:
- Integration to address multiple risk factors simultaneously
 - Embedding projects in established settings-based approaches

10h45-11h00 Coffee break

Breakout groups

- 11h00-12h30** Breakout group work on good practices in:
- Ensuring involvement of beneficiaries and communities
 - Increasing ownership and responsibility of all stakeholders
 - Identifying and mobilizing community resources in resource-poor settings

12h30-14h00 Lunch break

Breakout groups

- 14h00-15h30** Breakout group work on good practices in:
- Getting information into settings
 - Raising and sustaining awareness
 - Ensuring sustainability

15h30-15h45 Tea break

Plenary Session

15h45-17h15 Drawing out recommendations for policies and action strategies to address environmental risks to children's health in settings

Report backs on each case study by breakout groups

Plenary discussion and agreement on recommendations

Summary of Day Two (Chair)

17h15-17h45 Presentation of site visit and organization of Day Three

18h00-20h00 "Open Forum" of Healthy Environments for Children projects

DAY THREE

Thursday 1 December 2005

Site visit to Healthy Environments for Children project in Masindi district

Rapporteurs of the day's two groups meet with Secretariat after return from site visit

DAY FOUR

Friday 2 December 2005

Plenary Session

9h00-12h00 Theme four - Identifying and capitalizing on strengths of settings-based action to address children's environmental health

9h00-9h45 Report backs on site visit (15 minutes per group)

Recommendations on lessons learnt from site visit

9h45-10h15 Presentation - Drawing together the threads. What we have learnt and what we can conclude

- *Mrs Catherine Mulholland, WHO/HQ*

Plenary discussion

10h15-10h30 Coffee break

Plenary Session

10h30-12h00 Discussion and agreement on recommendations for moving forward with settings-based approaches to address environmental risks to children's health

12h30-14h00 Lunch break

Plenary Session

14h00-16h00 Theme five- Building capacity and building strength through linkages
Simultaneous interactive workshops to give participants an introduction and/or information on the following areas:

- How to network and link up and how to tap into information and financial resources for children's environmental health
Mr Bruce Gordon, WHO/HQ
- The Global Initiative on Children's Environmental Health Indicators
Ms Fiona Gore, WHO/HQ

- National children's environmental health profiles. What they are?
How to undertake one? Models from the African and Latin American regions.

Mrs Hawa Senkoro, AFRO

16h00-16h30 Tea break

Plenary Session

16h30-17h15 Closing session

Presentation of draft recommendations of the consultation

Agreement on next steps

Vote of thanks

Closing remarks and official closure

Annex 2

List of Participants

**HECA Inter-regional Consultation
Improving Children's Environmental Health in Settings
Experiences and lessons for policies and action**

*Imperial Resort Beach Hotel
Entebbe, Uganda
29 November - 2 December 2005*

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Annex 3



Settings-based initiatives to address environmental risks to children's health What works?

Working Draft

**Tabled for input and comments at the
Inter-regional Consultation on Healthy Environments for Children
Entebbe, Uganda, 29 November-2 December 2005**

Dear Participant in the HECA inter-regional consultation

The convening of the HECA inter-regional consultation, and the increasing interest in using settings to address environmental risks to children's health sparked interest in documenting the best current knowledge gained from interventions to address environmental risks to children's health, exploring what works, the essential elements of interventions, and how settings-based approaches, such as those adopted by the Healthy Environments for Children Alliance (HECA) can be used to their best advantage to improve children's environmental health.

The document attached is a "work in progress". As part of a consultative process, an initial draft is being tabled at the HECA inter-regional consultation in Entebbe, Uganda to provide an additional input to stimulate discussion, and elicit feedback, inputs and comments from participants, many of whom are at the forefront of efforts to use settings-based approaches to tackle the multiple risks in the environment that have an impact on children's health.

We hope you will find this working draft interesting reading. We look forward to your feedback during the meeting. and to including your inputs and case study examples to enhance the document.

Thank you

Summary

This paper examines a number of initiatives, projects, and studies of settings-based interventions that address environmental risks to children's health. It aims to examine the best current knowledge gained from interventions to address environmental risks to children's health, exploring what works, the essential elements of successful interventions, and how settings-based approaches, such as those adopted by the Healthy Environments for Children Alliance (HECA), can be used to their best advantage to improve children's environmental health.

The paper reviews ongoing programmes based on specific issues, such as water/sanitation/hygiene, indoor air, vector-borne diseases and others. It considers settings-based initiatives such as Healthy Cities, Health Promoting Schools and some newer programs, such as Healthy Marketplaces. It demonstrates a broad array of benefits from such interventions, ranging from meeting specific objectives to supporting overall individual and community development and progress, and it highlights key elements of success, useful in developing new projects to protect children's environmental health.

Introduction

The Healthy Environments for Children Alliance is a world-wide alliance to reduce environmental risks to children's health that arise from the settings where they live, learn, play, and sometimes work, by providing knowledge, increasing political will, mobilizing resources, and catalyzing intense and urgent action. (Annex will be added giving background and history of linkages between settings-based approaches, health and sustainable development and healthy environments for children).

In 1998, the term "settings for health" was introduced into the WHO Health Promotion Glossary. Settings for health are defined as "the place or social context in which people engage in daily activities in which environmental, organizational and personal factors interact to affect health and wellbeing... a setting is also where people actively use and shape the environment and thus create or solve problems relating to *health*." *Healthy Settings* encompass schools, marketplaces, health facilities, and workplaces.²

Settings can normally be identified as having physical boundaries, a range of people with defined roles, and an organizational structure. Action to promote health through different settings can take many forms, often through some form of organizational development, including change to the physical environment, to the organizational structure, administration and management. Settings can also be used to promote *health* by reaching people who work in them, or using settings to gain access to services, and through the interaction of different settings with the wider *community*.³

² (http://www.who.int/hpr/NPH/docs/hp_glossary_en.pdf)

³ (http://www.who.int/hpr/NPH/docs/hp_glossary_en.pdf)

Settings have been adopted as the primary context for the work of HECA because children are often exposed to more than one risk factor at a time; they are exposed to several risks simultaneously in the places, or settings, where they live, learn, play and sometimes work. Health risks in these settings are complex and often interconnected, and poverty is often the underlying common determinant of several risks. Using an integrated approach to tackle the multiple risks to children's environmental health in the places where children spend their time provides a focus for local action across a diverse array of environmental risk factors. A settings approach provides a framework to highlight the links among issues, and to facilitate action, in an integrated fashion, on the range of health risks in a given setting.

HECA concentrates on the home, school and neighbourhood settings as these are the places that children spend most of their time. These settings must promote good health and be free from risks to children's health and safety; yet they are often the places where children are most at risk.

Environmental risk factors to children's health in settings

The risks to children in their everyday environments are numerous. Six groups of environment and health issues stand out to be tackled as priorities as they cause the bulk of environment-related deaths and disease among children. These are: household water security, hygiene and sanitation, air pollution (including indoor air pollution and environmental tobacco smoke), vector-borne diseases, chemical hazards (for example lead, mercury, arsenic and the unsafe use of pesticides), and unintentional injuries. These risks exacerbate the effects of economic underdevelopment and they cause the bulk of environment-related deaths and disease among children, particularly those living in poor communities and countries.

While review of settings-based interventions to improve children's environmental health would be ideal, there are only a handful of studies published on this very specific topic. Other inputs for the development of this paper have been derived from review of studies on more traditional interventions, those that target a single issue of concern, for example, unsafe water or indoor air pollution. In the literature, there are more numerous studies that are concerned with establishing the scientific evidence for effectiveness of these targeted interventions in reducing negative health effects from a particular environmental risk factor. While not broad-based and not addressing a particular setting in a holistic way, review of progress in these issue-oriented interventions is still germane to understanding the interaction between environmental risk factors and a child's health and can easily be related to the settings in which children spend most of their time.

Effectiveness of issue-based approaches to environmental risks to children's health in settings.

Indoor Air Pollution⁴

Nearly half of the world continues to rely on solid fuels including wood, dung, agricultural remains and coal. Acute respiratory infections cause more than two million deaths in children every year,⁵ mainly in developing countries. Most of these are acute lower respiratory illnesses, primarily pneumonia, and result from the heavily contaminated indoor air from use of open fires indoors. Particulate matter, chemicals and infectious agents volatilize from open fires and ravage the respiratory systems of all the household members, especially children. WHO estimates that nearly one million child deaths every year are attributable to solid fuel use indoors,^{6,7} even when a wide range of interventions are available to curb indoor air pollution (IAP) and reduce the health burden which particularly affects women and children.

Many of the most effective interventions for reducing chronic and acute respiratory infections are undertaken in homes and intervene on: 1) the *source* of pollution; 2) the *living environment*; 3) *user behaviour*.

Table 1: Interventions for Reducing Exposure to IAP

<i>1: Source of pollution</i>	<i>2: Living Environment</i>	<i>3: User behaviors</i>
<p><i>Improved cooking devices</i> Improved biomass stoves without flues Improved stoves with flues attached</p> <p><i>Alternative fuel-cooker combinations</i> Briquettes and pellets Charcoal Kerosene Liquid petroleum gas Biogas, Producer gas Solar cookers (thermal) Other low smoke fuels Electricity</p> <p><i>Reduced need for the fire</i> Insulated fireless cooker (haybox) Efficient housing design and construction Solar water heating</p>	<p><i>Improved ventilation</i> Hoods, fireplaces, chimneys, built into the structure of the house Windows, ventilation holes, e.g., in roof, which may have cowls to assist extraction</p> <p><i>Kitchen design and placement of the stove</i> Kitchen separate from house reduces exposure of family (less so for cook) Stove at waist height to reduce direct exposure of cook leaning over fire</p>	<p><i>Reduced exposure through operation of source</i> Fuel drying Use of pot lids to conserve heat Good maintenance of stoves and chimneys and other appliances</p> <p><i>Reductions by avoiding smoke</i> Keeping children away from smoke, e.g., in another room (if available and safe to do so)</p>

Source: Modified from Ballard-Tremere and Mathee 2000

⁴ Extracted from WHO. *Solutions to the Indoor Air Pollution Problem: Indoor Air Thematic Briefing 3*. <http://www.who.int/indoorair/publications/iabriefing3.pdf>

⁵ WHO. The World Health Report 2002, Chapter 4, WHO: Geneva, 2002.

⁶ WHO. World Health Report 2002: Reducing Risks, Promoting Healthy Life. Geneva: WHO, 2002.

⁷ WHO, *Global Burden of Disease Due to Indoor Air Pollution*, WHO: Geneva, 2004, accessed at: http://www.who.int/indoorair/health_impacts/burden_global/en/

The largest reductions in indoor air pollution are achieved by switching from solid fuels to cleaner and more efficient fuels and energy technologies (see table above). However, in poor rural communities, where access to alternative fuels is limited and biomass remains the most practical fuel, pollution levels can be lowered significantly by using improved stoves with a chimney. Improved ventilation of the cooking and living area, for example through eaves spaces, and extraction through smoke hoods can also contribute to reducing exposure to indoor smoke.

These interventions to the living environment in home settings can be coupled with interventions aimed at changing behaviours (see table above). Such changes in user behaviour are unlikely to bring about reductions as large as those expected from a fuel switch or the installation of a hood or chimney. However, they should be seen as important supporting measures for other interventions.

Few studies have been undertaken to assess the effectiveness of the interventions described in the table above. As a result, current evidence is insufficient for drawing clear-cut conclusions about which interventions are most effective in reducing indoor air pollution and associated health effects. Sophisticated research projects, such as the first-ever randomized controlled trial on indoor air pollution in the highlands of rural Guatemala, evaluate the impact of reduced indoor smoke levels on children's and women's health.⁸

There is a need to complement the results in the health literature by distilling the lessons learnt from local intervention projects around the world. Household energy programmes, conducted over the past decades, range from small-scale NGO- and community-led initiatives to very ambitious national programmes, such as the Indian and Chinese National Improved Stove Programmes. A thorough evaluation of intervention projects and programmes should assess the extent to which a given intervention has been adopted and retained by the target audience, as well as whether it has been effective in reducing indoor smoke and exposure.

From a health point of view, the primary objective of interventions is to reduce occurrence of pneumonia, asthma and other chronic and acute respiratory ailments that impair children and even cause them to die. In addition, improved household energy practices can make multiple contributions to improving quality of life and enhancing future individual and community development. Consequently, interventions should also aim to achieve other secondary and outlying benefits, such as minimizing the risk of burns, increasing fuel efficiency, reducing the time lost to fuel collection or cooking on inefficient stoves, improving women's status and their opportunities for income generation, reducing stress on the local environment and contributing to an overall improvement in the quality of the home environment and natural resource base.⁹

⁸ <http://ehs.sph.berkeley.edu/guat/page.asp?id=1>

⁹ WHO. *Solutions to the Indoor Air Pollution Problem: Indoor Air Thematic Briefing 3*. <http://www.who.int/indoorair/publications/iabriefing3.pdf>

Overall, a few general lessons learnt emerge from the household energy literature that have wider relevance for both issue-based and settings-based approaches to addressing environmental risks to children's health:

- *Interventions must respond to the users' needs to ensure appropriate and continued use and maintenance. Consequently, it is important to involve users, particularly women, in assessing needs and developing suitable interventions.*
- *Low awareness of the health risks of indoor air pollution, low demand and limited financial resources among potential users means that both willingness and ability to pay can be major barriers to adoption. Putting into place and promoting targeted subsidies and/or micro-credit facilities can help overcome financial barriers. Where a viable market is in place, it is important to ensure wide availability of a choice of appropriately priced interventions.*
- *Local projects should not operate in a vacuum but be supported by appropriate policies at the national and/or local level that take an inter-sectoral approach (i.e. energy, health, environment, finance) and result in coordinated action.¹⁰*

Water, Sanitation and Hygiene¹¹

An estimated 1.8 million people die every year from diarrhoeal diseases, the vast majority children under five years of age, with 88% of this burden attributable to unsafe water supply, inadequate sanitation and hygiene. Interventions in water, sanitation and hygiene can avert a significant fraction of this burden of disease. Simple, household-based, water, sanitation and hygiene interventions are highly effective. Studies suggest that diarrhoeal episodes can be reduced:

1. between 35-39% through household treatment and safe storage of water;
2. by 37.5% for improved sanitation; and
3. by 35% through hand washing.

The starting point is the household, as people are most likely to be at risk from contamination in the place where they spend most of their time. This household centered approach may tend to reverse the way in which planners and engineers view the situation, as their starting point is at centralised treatment and distribution systems rather than households. Adopting a household centered intervention provides the opportunity to find out what household members think about the water and sanitation situation they already have and to explore what they actually want, rather than have other people decide for them. When people are ignored and the local context is not taken into account, sanitation schemes will more likely fail. Social marketing is likely to be a key means of stimulating effective demand. This has to be followed up with supporting and facilitating measures to respond to the demand.

Household water treatment and safe storage (HWTS)

In many areas, water used in the home is dangerously unsafe, either because it was grossly contaminated at its point of collection, or because the quality of stored water

¹⁰ WHO. *Solutions to the Indoor Air Pollution Problem: Indoor Air Thematic Briefing 3*.
<http://www.who.int/indoorair/publications/iabriefing3.pdf>

¹¹ Some text for this section extracted from the WHO-led Sanitation Connection, www.sanicon.net, accessed 1 November, 2005

subsequently deteriorated, often through contact with children's hands. An increasing body of evidence has suggested that home-based approaches to managing water are extremely effective. This decentralized treatment of drinking water enables families to take charge of their own water safety in advance of a piped water distribution system. The best household treatment technologies are highly effective, inexpensive, acceptable, easy-to maintain, and often use of local materials. Promising HWTS technologies/systems include:

- *Chlorination* – adding chlorine in liquid or tablet form to drinking water stored in a protected container
- *Solar disinfection* – exposing water in disposable clear plastic bottles to sunlight for day, typically on the roof of a house, inactivate pathogens;
- *Filtration* - ceramic filters with small pores, often coated with silver for bacteriostasis, have been shown to be effective at removing microbes and other suspended solids. Filters need to be cleaned regularly.
- *Combined flocculation/disinfection systems* – adding commercially developed powders or tablets to coagulate and flocculate sediments in water followed by a timed release of disinfectant.
- *Boiling* - if practical, households can disinfect their drinking water by bringing it to a rolling boil, which will kill pathogens effectively except at high altitudes.

Different technologies are better suited for different situations. Solar disinfection, for example, may be best suited for very poor households in sunny regions that draw relatively clear water. Ceramic filters, despite their high-up front costs, have proven to be accepted without major behaviour change efforts because the water tastes good and is not chemically altered. Household chlorination has achieved widespread use and is the most mature treatment approach.

Point-of-use disinfection is relatively inexpensive. Solar disinfection is free if disposable soda bottles are available. Bleach solution costs very little to produce, and as little as, 10-25 cents worth can last a family an entire month. Simple ceramic pot filters molded by local artisans can be used to filter water in the home for approximately \$3 / year, making them sustainable and economical¹². While household water interventions are inexpensive, they all require additional time on the part of users. At the global level, a recent World Health Organization report suggests that household water interventions can lead to a health benefit valued up sixty times the initial investment¹³.

Treatment also needs to be accompanied by safe storage, which can be accomplished by using containers with narrow opening and a dispensing device such as a tap or spigot to

¹² Gundry SW, Sobsey M, Wright JA (2004): 'Household Water Treatment In Developing Countries – Evidence from the Field'. Water and Health Workshop, International Water Association World Water Congress and Exhibition, September 23rd, Marrakech

¹³ Hutton, Guy and Haller, Laurence. 2004. "Evaluation of the Costs and Benefits of Water and Sanitation Improvements at the Global Level." Water, Sanitation and Health Protection of the Human Environment, World Health Organization, Geneva WHO/SDE/WSH/04.04 http://www.who.int/water_sanitation_health

protect collected water. These measures are particularly important because, as mentioned above, the bacteriological quality of drinking water frequently declines after collection.

Safe disposal of children's waste

The faeces of babies and young children are not considered to be dirty in many societies. However, the faeces of babies and young children are often the most dangerous because they may have a higher concentration of pathogens. It is the faeces of these two groups that are most frequently found in the environment. Several studies have shown associations between the incidence of diarrhoea in a household and children defecating in living areas. Another study reported that unsanitary disposal of children's faeces was associated with a 34% increase in clinical diarrhoea and a 64% increase in pathogen positive diarrhoea in children from families that did not adequately dispose of their faeces compared to a control group. Sanitation interventions that facilitate the safe disposal of faeces from babies and young children will reduce diarrhoeal disease at the household and community levels.

For a sanitation facility to protect public health it needs to:

- Isolate the user from his or her own excreta;
- Isolate communities from exposure to excreta (e.g. through contaminated drinking water);
- Prevent nuisance animals (e.g. flies) from contacting the excreta and subsequently transmitting disease to humans; and
- Contain the excreta and/or inactivate the pathogens.

Inadequate sanitation impacts on children. Even where facilities are available, there are problems of acceptability and sharing of latrines and of the willingness of children to use them. There is a need for special attention to childrens' sanitation (including health and hygiene education) both in the home and at school. Household members can ensure safe excreta disposal by providing child-friendly, accessible latrines. Latrines should be well-lit and ventilated, and pleasant and safe to use. For example, a small hole would eliminate a younger child's fear of falling in.

Hygiene and Handwashing

Interventions to promote personal and domestic hygiene are also effective in reducing disease. In particular, handwashing with soap; after defecation; after handling babies' faeces; before feeding and eating; and before preparing food have significant impacts on diarrhoeal morbidity (WHO, 1993). Huttly (1992) reviewed the effects of handwashing and a combination of handwashing and other hygiene behaviours from several studies in table 3. The median reduction in diarrhoea morbidity due to improved hygiene was 33%.

Coherence and Integration in Interventions

Household water management implementers have suggested that sensitizing households, and communities to the importance of water quality opens the door to good hygiene, and improving key behaviors, such as handwashing.

Access to water and sanitation must be accompanied by promotion of hygiene behavior. Health benefits from water and sanitation programs will not be fully realized unless hygiene behavior is promoted and achieved. It is the correct use of the appropriate technology which results in the greatest health impact. In Bolivia, a baseline study showed that diarrhea prevalence was highly correlated with poor hygiene behavior among mothers and caretakers, not with water source or type of sanitation. In Bangladesh, an integrated intervention project installing hand pumps and pit water-sealed latrines together with promotion of hygiene behavior such as water use and use of latrines, resulted in 25% fewer episodes of diarrhea in the intervention area compared to the control area.

To achieve the health impacts of environmental health interventions, the concept of “behaviour first” needs to be adopted. This concept requires that before initiating environmental health improvement interventions or facility construction, program planners need to identify behaviors associated with disease transmission in their target areas. Based on identified behaviors, strategies for bringing about the needed changes in those behaviors must be developed and included in the overall program planning.

Food Safety

(Inputs expected for this section)

Closely related to water, sanitation and hygiene, particularly with regard to reducing the incidence of diarrhoeal diseases among children, is the issue of food safety. The global incidence of foodborne disease is difficult to assess accurately, but it has been estimated that each year 2.1 million people die as a result of diarrhoeal diseases. Children, pregnant women, the immunocompromised and the elderly are at greatest risks of both contracting foodborne diseases and suffering more severe adverse health effects. In developing countries (excluding China), 1.3 million children under the age of five die each year due to diarrhoeal disease. Up to 70% of these cases may be caused by foodborne pathogens. While the burden of foodborne disease is considerable in developing countries, it also remains a major problem in developed countries and imposes a heavy social and economic burden on communities and their health systems.

Foodborne illness can be caused by microbiological (bacteria, viruses and parasites), chemical (pesticides and other toxic chemicals) or physical hazards (glass, metal, wood fragments or other objects). Governments, industry and consumers have a shared responsibility in ensuring the safety of food. However, many foodborne diseases occur as a result of basic errors in food handling and preparation all along the food chain from producers to consumers. Many food-borne illnesses can be avoided if those who are involved in ensuring food safety throughout the entire food chain are knowledgeable about elementary food safety and apply this knowledge daily. Central to providing this knowledge and building good food safety practices are the Five Keys to Safer Food developed by WHO in 2001.

A number of effective interventions exist to address food safety at different points along the food chain and all of these reduce the risks to children's health downstream. However, potentially the most effective interventions are those that are closest to children and are undertaken in settings frequented by children such as homes, schools and marketplaces. One such approach is highlighted in the section below on healthy marketplaces.

Unintentional Injury

In 2001, an estimated 685,000 children under the age of 15 were killed by unintentional injuries, mostly from road traffic injuries, drowning, burns, falls and poisonings.¹⁴ Non-fatal injuries affect the lives of between 10 million and 30 million children and adolescents each year¹⁵.

Injuries are not inevitable; experience has shown that they can be prevented or controlled. However, much of the world literature on evaluated interventions in child and adolescent injury prevention has been dominated by a few high-income countries. These studies show that concerted effort has helped reduce child and adolescent injury death rates in a range of developed country contexts by more than 50%¹⁶. Proven intervention in these countries may not be readily transferable to low- and middle-income countries or may require careful adaptation.

Physical relationships are universal so that many injury counter-measures have relevance globally. Examples include seat belts, motorcycle helmets, child restraints, child resistant packaging for pharmaceuticals, reductions in the temperature of domestic hot water and barrier fencing for swimming pools. The more problematic component of injury prevention interventions is the implementation process, which is less well understood and is likely to be regionally and locally specific.

Primary and secondary preventive measures, which have been used to address child and adolescent injury, both separately or in combination include: promotion of safety devices (such as child restraints in vehicles); legislation, regulation and enforcement; product modification; environmental modifications; bans or restrictions on the sale of hazardous

¹⁴ WHO. *What happens when children live in unhealthy environments?* Healthy environments for children: facts and figures, World Health Organization: Geneva, 2003, accessed at: www.who.int/mediacentre/factsheets/fs272/en/.

¹⁵ Child and adolescent injury prevention: a global call to action, WHO and UNICEF, Geneva 2005, p6)

¹⁶ Effective interventions highlighted in developed country contexts include: legislation aimed at preventing burns from hot tap water resulting in a 60% reduction in serious domestic hot water scalds among children; covering of windows to prevent morbidity and mortality from window falls resulting in a 50% to 90% reduction in child fall deaths; legislation on child-resistant packaging for pharmaceuticals and reducing dosages resulting in reductions of about 50% in poisoning deaths of children under 5 years between 1964 and 1992; speed reduction, traffic calming, child restraints and bicycle helmets leading to reductions in road traffic injury death rates in children (Need to put back in references to studies cited)

products; supportive home visits; ; education and skills development; and community-based studies. Interventions that appear to be most effective are those with multidimensional strategies including education, legislation and environmental modification. Many interventions have been developed and adopted by multi-sectoral action, often involving industry and in waves of action that involve step-like interventions, with development, evaluation and promotion preceding regulation and compulsion.

Legislation, regulation and enforcement have proved to be one of the most powerful tools in the prevention of injury¹⁷. Product modification has contributed to reducing childhood injuries. For example there is considerable evidence that the introduction of child resistant packaging and dosage control have reduced the number of childhood deaths from poisoning. This has relevance globally and is being promoted in a number of interventions to prevent, for example, childhood poisoning from accidental ingestion of kerosene used for cooking and heating and stored in non-child resistant containers¹⁸. Environmental modification to make environments more child safe has become an important approach in injury prevention, benefiting not just children but all ages, in the passive protection it affords. Assessments of traffic calming schemes on crash related deaths and injuries in all age groups have shown that area-wide traffic calming in towns has the potential to reduce road traffic injuries.

Engineering solutions and top-down legislative changes can have immediate applicability and, with adaptation, enforcement and appropriate support, have had large effects in highly defined, single purpose public environments such as the workplace and road environment. However other settings where childhood injury is taking place are far more varied, less clearly delineated, largely private, and hence far less easy to engineer and regulate. For example, simply introducing countermeasures (e.g. car seat restraints, bicycle helmets) is not sufficient, and effective means of conveying countermeasures are necessary so that the measure becomes embedded in the social and physical structures of community function.

Alongside action at the macro level has been development of the community based (or community intervention) model for injury prevention which is characterized by a shared ownership of the injury problem and its solution by experts and community members, combined with joint responsibility for determining appropriate priorities and interventions. The model acknowledges a complex causal web embedded in social and organizational structures; a coordinated multi-strategy response; and an emphasis on optimizing community involvement.¹⁹ This model underpins a number of growing global movements, including the Safe Kids Worldwide Campaign and WHO's Safe Communities as well as similar national movements in a number of developed countries.

¹⁷ For example reviews show there is strong evidence of child safety seat laws in increasing levels of restraint use and reducing injury rates¹⁷.

¹⁸ For example see the Paraffin Safety Association of Southern Africa (<http://www.pasasa.org/new/index.html>)

¹⁹ Moller J. *Community-based interventions: an emerging dimension of injury control models*. *Health Promotion Journal of Australia* Vol. 1, No. 2, 51-54, 1991 as cited in A Spinks et al. *Community based prevention programs targeting all injuries for children*. *Injury Prevention*. Vol 10, 180-185, 2004.

A systematic review of community-based studies carried out in 2002²⁰ found that, overall, the community-based programs were effective, that they succeeded in carrying the same message from a variety of agencies using an assortment of styles and mechanisms to the target audience and that the messages were internalized and led to behavior change. Another systematic review undertaken in 2004²¹ highlighted that there are insufficient studies and too great a variation in the results to provide definitive evidence as to the effectiveness or otherwise of community based, multi-strategy multi-focused programmes for the prevention of all causes of injury in children.

At the same time, injury prevention is by its nature is cross-disciplinary and multisectoral. While effective action can be taken in individual areas of responsibility, best practice intervention faces the challenge of drawing together multiple stakeholders across many sectors. Among the lessons that can be drawn from community-based interventions for injury prevention which have wider applicability to broad-based settings approaches to environmental risks to children's health include:

- the importance of community participation and ownership;
- the need to tailor interventions to different community needs (adaptability of approaches and interventions)
- the need for long-term strategies;
- mechanisms for sustained collaboration of different concerned disciplines and agencies;
- the importance of networking within communities;
- the importance of using existing measures and systems to assess results and communicate these to policy and decision-makers as well as to the wide public.

Vector-Borne Diseases

Five vector-borne diseases cause high rates of morbidity and mortality among children are malaria, dengue and dengue hemorrhagic fever, schistosomiasis, Japanese encephalitis and lymphatic filiarisis. Of these malaria is the biggest killer responsible for more than 1 million deaths among children under five years. About 90% of the disease burden is centered in Sub-Saharan Africa.

A combination of five interventions in different settings is proposed for the mosquito-borne diseases: use of insecticide impregnated mosquito nets; the fitting of screens to windows, doors and eaves of houses; the application of zoophylaxis in places where

²⁰ Towner, Elizabeth, and Dowswell, Therese. *Community-based childhood injury prevention interventions: what works?* *Health Promotion International*. Vol. 17, No. 3, 273-284, September 2002, Oxford University Press 2002. accessed at: <http://heapro.oxfordjournals.org/cgi/content/full/17/3/273>.

²¹ A Spinks et al. *Community based prevention programs targeting all injuries for children*. *Injury Prevention*. Vol 10, 180-185, 2004.

mosquitoes are distinctly zoophilic; the use of insect repellents; and improved water management.

New strategies for prevention and control of vector-borne diseases are emphasizing "Integrated Vector Management" – as an approach that reinforces linkages between health and environment, optimizing benefits to both. IVM strategies are designed to achieve the greatest disease control benefit in the most cost-effective manner, while minimizing negative impacts on ecosystems (e.g. depletion of biodiversity) and adverse side-effects on public health from the excessive use of chemicals in vector control.

Rather than relying on a single method of vector control, IVM stresses the importance of first understanding the local vector ecology and local patterns of disease transmission, and then choosing the appropriate vector control tools, from the range of options available. These include environmental management strategies that can reduce or eliminate vector breeding grounds altogether through improved design or operation of water resources development projects as well as use of biological controls (e.g. bacterial larvicides and larvivorous fish) that target and kill vector larvae without generating the ecological impacts of chemical use.

A recent systematic review²² looked at the effectiveness of malaria control measures built round environmental management to reduce malaria transmission.²³

The review found very high summary protective efficacies on clinical malaria parameters regardless of whether environmental modification, environmental manipulation, or modification of human habitation or behaviour were used. Most of the malaria control programmes based on environmental management were to some degree accompanied by other control measures, which probably contributed to their overall success.

Conclusions suggest that Environmental management can have a major role within integrated vector management²⁴, adding resilience to the results of individual control

²² Keiser J. Singer B. Utzinger J. *Reducing the burden of malaria in different eco-epidemiological settings with environmental management: a systematic review.* <http://infection.the-lancet.com> Vol. 5, November 2005.

²³ "Environmental management is the planning, organization, carrying out and/or manipulation of environmental factors or their interaction with man with a view to preventing or minimizing vector propagation and reducing man-vector-pathogen contact".²³ The major approaches of environmental management comprise: 1) environmental modification, which aims to create a permanent or long-lasting effect on land, water, or vegetation to reduce vector habitats (e.g. installation, cleaning and maintenance of drains, or the systematic elimination of standing pools of water); 2) environmental manipulation, which produces temporary unfavourable conditions for the vector; and 3) modification or manipulation of human habitation or behaviour, which reduces man-vector contract. Important features of environmental management strategies are their non-toxicity, relative ease of application, cost-effectiveness and sustainability²³.

²⁴ See WHO. *Global strategic framework for integrated vector management.* Geneva: WHO2004. WHO/CDS/CPE/PVC/2004.10

strategies and reducing costs, and the likelihood of development and spread of drug and insecticide resistance.²⁵

Recently developed malaria transmission models strengthen the evidence that substantial reductions of the entomological inoculation rate are possible when an integrated malaria control programme with multiple interventions implemented simultaneously is used²⁶

Essential features of successful malaria control programmes which provide lessons of relevance for settings-based approaches include:

- Environmental management tools used were idiosyncratic to the individual eco-epidemiological settings and vectors;
- Community participation and usually also health education were integral parts of the programmes;
- In general a package of multiple interventions guided by a specifically trained multisectoral staff was used with expertise in malaria epidemiology and entomology, vector ecology, and land and water engineering;
- Intersectoral collaboration was a feature of all successful programmes. A benefit of interdisciplinary collaboration between health, agricultural, water and infrastructure development sectors meant that higher expenses of environmental management are not borne by the health sector and that malaria control per se is not the driving force. For example, the vector control impact of engineering works such as drains comes nearly free of charge to the health sector and is simply a by-product of the design of the drainage system to also serve the needs of malaria control.

Toxic Chemicals

(Inputs expected for this section)

Effectiveness of Settings-Based Approaches in Addressing Environmental Risks to Children's Health

It is generally acknowledged in health promotion circles that the settings approach has emerged as an effective tool to focus multisectoral efforts to achieve concrete public

²⁵ See Lindsay S, Kirby M, Baris E, Bos R. *Environmental management for malaria control in the East Asia and Pacific region*. Washington DC: International Bank for Reconstruction and Development/World Bank, 2004.

²⁶ See McKenzie FE, Baird JK, Beiere JC, Lal AA, Bossert WH. *A biologic basis for integrated malaria control*. *American Journal of Tropical Medicine and Hygiene* 2002; 67: 571-77 and Killeen GF, Seyoum A, Knols BG. *Rationalizing historical successes of malaria control in Africa in terms of mosquito resource availability management*. *American Journal of Tropical Medicine and Hygiene* 2004; 71 (suppl 2): 87-93 as cited in Keiser J, Singer B, Utzinger J. *Reducing the burden of malaria in different eco-epidemiological settings with environmental management: a systematic review*. <http://infection.the-lancet.com> Vol. 5, November 2005.

health goals. There are, however, a number of problems which make it difficult to make firm statements on the effectiveness of settings-based approaches in general, and their effectiveness in addressing environmental risks to children's health in particular.

The first problem revolves around evidence of effectiveness of settings-based approaches. In a review of literature on effectiveness of settings-based interventions aimed at improving children's environmental health, one consistent message is that better measures of the outcomes of interventions are needed. This brings to the surface a variety of issues, both linked to the science-based evidence on which to base recommendations for policy and practice in issue areas, as well as the ongoing debates around the evaluation of effectiveness of health promotion interventions.

It is widely acknowledged that community or settings-based projects that take a health promotion approach are hard to measure. This is true also when looking at settings-based interventions to improve children's environmental health as long-term, broad-based interventions to generally improve the environmental health and well-being of children is often vague, difficult to tease out in terms of "cause and effect" linkages, and do not provide "quick fixes" which are often the most attractive to both government and donor sources of funding. Yet, without good monitoring and evaluation systems based on sound, appropriate and measurable indicators, reporting and publication of results, it becomes increasingly difficult to gain support, financing and interest in settings-based approaches. In turn, these evaluations also inform other interventions and influence their design, lead to better decision-making and add to cost efficiency and positive programmatic outcomes.

Another problem is that, in general, most settings-based approaches do not focus on environmental health issues per se, but many of them include some environmental health issues as part of the overall strategies developed and multi-sectoral plans drawn up to improve population health and well-being in a wide range of settings. The emphasis on environmental health issues is often a function of the pressing nature to address issues such as safe water, sanitation, air pollution, vector-borne diseases, toxic chemicals or unintentional injuries in a specific context. Nor do most settings-based approaches have a specific focus on children. However, the measures taken to make the particular setting healthier will most often have positive impacts on health status outcomes of children. These can also be maximized by taking into account the risk factors in a setting that have particular significance for children's health and well-being and children's specific vulnerability.

Notwithstanding the above, examining different settings-based approaches can provide important insights for effective interventions in addressing environmental risks to children's health.

Healthy schools

One group of settings-based initiative that has proved its effectiveness in a number of regions over the last 10 years is the "healthy schools" or "health-promoting schools" initiatives. By definition a health promoting school is one that constantly strengthens its capacity as a healthy setting for living, learning and working.

A health promoting school:

- Fosters health and learning with all the measures at its disposal.
- Engages health and education officials, teachers, teachers' unions, students, parents, health providers and community leaders in efforts to make the school a healthy place.
- Strives to provide a healthy environment, school health education, and school health services along with school/community projects and outreach, health promotion programmes for staff, nutrition and food safety programmes, opportunities for physical education and recreation, and programmes for counselling, social support and mental health promotion.
- Implements policies and practices that respect an individual's well being and dignity, provide multiple opportunities for success, and acknowledge good efforts and intentions as well as personal achievements.
- Strives to improve the health of school personnel, families and community members as well as pupils; and works with community leaders to help them understand how the community contributes to, or undermines, health and education.

Two systematic reviews of health promoting schools and health promotion in schools published in 1999 concluded that school health promotion initiatives can have a positive impact on children's health and behaviour but do not do so consistently. Most interventions are able to increase children's knowledge; however, changing other factors which influence health, such as attitudes and behaviour, is much harder to achieve, even in the short-term. Overall a multi-faceted approach is likely to be most effective, combining a classroom programme with changes to the school ethos and/or environment and/or with family/community involvement. This is consistent with the health promoting schools approach.²⁷

Some examples of health-promoting schools have demonstrated that environmental risks to children's health can be addressed successfully in the school setting. These include water, sanitation and hygiene, food safety and helminth infections. Among the strengths that can be identified for using this settings-based approach to children's environmental health are the following:

- An environmental risk factor can provide an "entry point" to a wider agenda of health promotion including environmental health.
- Multiple risk factors to children's health in an well-defined setting with an institutional framework can be addressed simultaneously.

²⁷ Lister-Sharp D, et. al. *Health promoting schools and health promotion in schools: two systematic reviews. Health Technology Assessment*. 1999. Vol. 3: No. 22 (Executive summary)

- Benefits go beyond the school walls and are picked up in households and by the wider community, thereby increasing the impact of health education and health promotion for environmental health, as well as creating a dialogue among children, schoolteachers and authorities, and parents, and a willingness to tackle issues together.

Using "entry points" to build settings-based approaches

A study in China credits *Health Promoting Schools* with success in reducing helminth infections in school children.¹ De-worming, health education, improving the physical environment of the school, developing policies and strengthening the relationship among the school, community and parents were involved in this project, which had an overall effect of reducing helminth infections by 80%. Not only were reduction in infections achieved but also many other benefits arose from this project, including safer buildings, better equipment, improved health education, strengthened parental involvement and spread of knowledge from children to families. The project was considered highly successful. A valuable lesson learned was that concentrating on a single health issue was an excellent way to inspire a school and its community to become supportive of *Health Promoting Schools*.

A general conclusion of *Health Promoting Schools* is that it has the necessary elements of success and can be effectively used to promote children's environmental health in the school setting. Early successes show how teaching students can improve their health, as well as spread knowledge to parents, teachers and other members of the community. Many experts have pointed out, however, that promoting environmental health in schools requires that the schools offer access to that basic healthy setting about which it is teaching. It is hard to teach hand-washing in a school with no piped water or to teach hygiene in a school with no sanitation facilities. A focus on the school as a healthy setting must involve many sectors of the community and the public it serves in order to provide the basic necessities of a healthy school environment and instruct children for their own health and that of others in the community.

Healthy homes

(this section being worked on)

Healthy villages

(Experiences and evidence from EMRO and other regions)

How do they address environmental risks to children's health?

How effective are they?

Healthy islands

(Experiences from WPRO and other regions)

How do they address environmental risks to children's health?
How effective are they?

Healthy marketplaces

An important setting in cities and towns is the food market. A common feature of most food markets is the wide array of foodstuffs available. These foods are often sold fresh by local producers at reasonable prices. In addition, food markets usually offer street-vended foods, which are an important source of ready-to-eat foods that are accessible and affordable for even the lowest income members of the community. Food purchased in food markets are often an inexpensive source of food for children. At the same time, food markets can be a source of health hazards from biological, chemical and physical sources.

All of these risks can be addressed using a settings-based approach and, with this in mind, WHO began the promotion of Healthy Food Markets as an approach for promoting food safety and related environmental health issues²⁸. A Healthy Food Market is a setting in which all stakeholders collaborate to provide safe and nutritious food for the community.

This settings-based intervention offers advantages to numerous groups: primary food producers; food market vendors; food market managers; health and environment authorities; city and community leaders; the adjacent community which includes children who come into contact with the food market in a number of ways; and consumers themselves among which we also find a high percentage of children. Among the advantages are:

- Access to safe and nutritious food;
- Increased community health (including access to adequate hygiene facilities) and environmental safety;
- Reduced household and community health care costs;
- Better knowledge and practice with regard to food safety, general hygiene; selection of safe and nutritious food.

In addition, because most food passes through the market, it affords the most cost-effective location for monitoring food for safety and if necessary, for intervening. This is particularly important in situations where food control capacities are otherwise limited.

This relatively new approach is in pilot project stage and has not been evaluated for its effectiveness in meeting its objectives of providing safe and nutritious food to the community; improving food safety from production to consumption; fostering partnerships among food suppliers, government and consumers. The first evaluation of outcomes of the pilot phase are expected soon

Benefits from settings-based approaches

²⁸ Moy, G.G. Healthy Food Markets: an approach for ensuring food safety and environmental health, Food Control, 12 (2001) 499-504

In examining the results derived from settings-based approaches to environmental risks to children's health, it is interesting to note that the benefits gained often go beyond the primary objective of the project. For the purposes of this paper, benefits from settings-based approaches can be seen as falling into three general categories:

- the primary and targeted results from the intervention;
- secondary benefits that are related to the intervention but reach beyond the specific targeted goal;
- outlying benefits that might not have been anticipated, did not directly relate to the targeted outcome but were generally supportive of the intervention and could conceivably lead to its longer-term sustainability.

Primary benefits from interventions to address environmental risks to children's health relate to the stated objective(s) of the intervention. In properly evaluated projects and published studies, indicators are chosen and measures established to assess whether the stated objectives have been met by the intervention.

Secondary benefits are ones that are related to the initial specific goal but go beyond the initial specific targeted outcomes. For example, the de-worming project in China (see table below) achieved this type of outcome when children began to teach their parents about ways to avoid infection. Teaching curricula were modified to incorporate health education and a charter for improved food hygiene in school kitchens was also established. In a water and hygiene project in Pakistan, an important finding was that different populations, even within the same general area or community, may need different amounts of time, instruction and encouragement to change behavior; yet they will eventually achieve the same positive results as other sub-populations. A nutrition-childhood infectious disease study in Viet Nam reported increased nutrition awareness of mothers.

Outlying benefits are those derived from a project but not directly related to its purpose. For example, the China study saw purchase of new school play equipment, tree planting, better school conditions and installation of a garbage cans in schools. The relationship between schools and communities were strengthened. The general improved care, interest, ownership, sense of participation, pride, dignity -- all of these less measurable factors that result from community-based projects are often the ones that underpin long-term sustainability of projects. They are important results yet are the ones hardest to achieve and hardest to measure. These are the results of highest expectation for an intervention, to sustain change and improve health for all children for generations to come.

The table below provides some examples of primary, secondary and outlying benefits that can be identified from some of the initiatives and studies reviewed for this paper.

Intervention objective	Primary benefit(s)	Secondary benefit(s)	Outlying benefits(s)
Use de-worming as an entry point to develop a "health-promoting school" ²⁹	80% decrease in helminth infection in students and environmental contamination by helminth eggs in schools at end of 1 year.	Improvements in student's knowledge, behavior and skills of health protection.	Family health behavior positively affected. New play equipment, tree planting, better school conditions and installation of garbage cans in schools. The relationship between schools and communities were strengthened.
Employ an awards system to increase participation in health promoting schools ³⁰	Increase in participation in healthy schools initiatives.	Increased awareness of students about environmental health.	The general improved care, interest, ownership, sense of participation, pride, dignity at school.
Improve Household water disinfection and hygiene. ³¹	Up to 73% decrease in diarrheal disease and sustained behavioral change (hand-washing).	Changed behavior for the family, using soap to wash hands, continually disinfection water.	Understanding that time lags are required to achieve results and that different time lags are required for different groups, for example, income disparity, cultural differences, etc.
Achieve a safe and healthy food program, incorporating micro-gardening and education. ³²	Reduction in incidence of diarrheal disease and acute respiratory infection; increase in healthy food intake.	Increased nutrition awareness of mothers.	Empowerment of women to care for their families through improved knowledge on nutrition and increased capabilities in micro-agriculture.

²⁹ Long-shan Xu, et. al. *Creating health-promoting schools in rural China: a project started from deworming*. *Health Promotion International*. Vol. 15, no. 3, 197-206, September 2000, Oxford University Press, accessed at: <http://heapro.oxfordjournals.org/cgi/content/full/15/3/197>.

³⁰ Rogers E, Moon AM, Mullee MA, Speller VM, Roderick PJ. *Developing the 'health-promoting school'--a national survey of healthy schools awards*. *Public Health*. 1998 Jan;112(1): 37-40. [Medline].

³¹ Luby, Stephen P, et. al. *Delayed Effectiveness of Home-Based Interventions in Reducing Childhood Diarrhea, Karchi, Pakistan*. *American Journal of Tropical Medicine and Hygiene*, vol 7(4), 2004, pp. 420-427.

³² English, RM, et.al. *Effect of nutrition improvement project on morbidity from infectious diseases in preschool children in Vietnam: comparison with control commune*. University of Queensland, Department of Social and Preventive Medicine, Medical School, Herston, Australia. renglish@ozemail.com.au

<p>Reduce death and disability in children from unintentional injuries</p>	<p>Measured decreases in targeted childhood injuries</p>	<p>Increased public awareness and participation in injury prevention programmes Supply of safety equipment at reasonable costs Increased participation and reporting by the media</p>	<p>Improved equipment, generally increased community interest</p>
<p>Reduce pesticides poisonings through safe alternatives.</p>	<p>Reduction in number of poisonings and severity of poisonings.</p>	<p>Community-based committee to control pesticide usage. Agreement across region on restricted use of pesticides most dangerous to health. Increased awareness of agricultural workers on the proper use of pesticides, as well as the dangers that pesticides pose.</p>	<p>Heightened awareness in community of the risks from pesticides. Development of school education curricula incorporating chemical and pesticide risks.</p>

Challenges of settings-based approaches

It is also important to highlight some of the challenges facing broad-based, multi-sectoral approaches in general that are equally applicable to those that aim to address environmental risks to children's health.

- **Monitoring and evaluating.** The challenge to measure progress and outcomes is probably the greatest weaknesses found in many of the initiatives reviewed. Measurements are sparse and outcomes are difficult to define. For example, it is harder to measure success of a community-based water disinfection and behavioral change project than it is to demonstrate the success of a technical intervention to disinfect water. To overcome this challenge, a clear set of objectives must be stated and with those objectives, measures of their success must be defined.
- **Demonstrating "cause and effect".** In integrated health promotion work such as settings-based approaches, it is inherently difficult to establish clear lines of "cause and effect" that can be objectively measured and used to demonstrate which aspects of a particular intervention lead to which outcomes. Hence the importance of choosing indicators, establishing clear frameworks for monitoring and evaluation which include both quantitative and qualitative data and look at both process and outcome measures.
- **Time lag for results.** Intrinsic to settings-based approaches is a time lag between interventions and results. Often donors and government agencies want to show results within a funding year in order to justify expansion or strengthening of a project, yet changing behavior on a community-wide scale may take years to achieve. While settings-based approaches seek this longer-term outcome, policy and political agendas often call for shorter-term results. Good communication can overcome much of this challenge. Communication on progress, reporting measurements that show progress and providing periodic updates creates understanding of the time needed to gain results.
- **Inherent complexity of multi-sectoral approaches.**
- **Resource issues including tapping resources for health promotion approaches and getting over the obstacle of sectoral (line ministry) budgeting.**

Conclusion

Based on this review it can be concluded that settings-based interventions have potential to effectively address environmental risks to children's health. Some initiatives such as the health-promoting school project in rural China demonstrate strong effectiveness and positive primary, secondary and outlying benefits. Others, such as childhood unintentional injury prevention, show promise and therefore support continuation of settings-based approaches.

Children face multiple environmental risks to health in the settings where they spend the majority of their time. Settings-based approaches have demonstrated their effectiveness in linking up and addressing a number of risk factors simultaneously or in succession as part of an incremental change strategy.

Children face multiple risks to health in the settings where they live, learn, play and sometimes even work. Settings-based approaches are embedded in a broad health promotion framework that opens up opportunities for integrated approaches that address a number of environmental risks to children's health simultaneously. At the same time they may contribute to more integrated thought that allows for better coherence, both at policy level, as well as in interventions themselves. In time this may help avoid interventions that, for example, concentrate solely on providing safe water to reduce incidence of diarrhoeal disease without taking into account other pathways of exposure to pathogens such as through poor storage of water, poor hygiene or unsafe food.

Caring for the health and well-being of children is by nature a multi-faceted undertaking and calls for action by a wide variety of actors and sectors. Settings-based approaches have shown themselves to be effective in linking up multiple actors and sectors, and ensuring their "ownership" of an issue or issues which are essential elements for effective action.

Settings-based approaches offer options for interventions that can be undertaken immediately in resource-poor settings by people themselves using their own resources.

Settings-based approaches have also been convincing in demonstrating their adaptability. Their broad base and health promotion approach allows for flexibility and adaptability to different situations/contexts/cultures/traditions/practices and environmental health priorities.
