International Study Visit to the Healthabitat/CHDS Village Sanitation Project, Nepal

30th October – 3rd November 2012



A Collection of Perspectives



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Introduction

Diane Diacon and Jelly Mae Moring, BSHF, United Kingdom

The forthcoming study visit to the Healthabitat/CHDS Village Sanitation Project in Nepal represents an invaluable platform to share knowledge and experiences, to exchange ideas around broader issues relevant to your work and to produce new forms of knowledge collaboratively. In this respect, ahead of and during the visit, we would like to explore with you how improved housing and living environments lead to improved health outcomes in vulnerable and low-income communities.

It is commonly assumed that there is a direct link between housing and health. Indeed, a wealth of research has attempted to demonstrate a clear causal relationship between housing conditions and health outcomes. The relationship between housing and health is multi-faceted and very complex considering the various interacting factors that influence housing quality and health status. Some of these factors are poverty, poor nutrition, violence, exposure to weather, pests and toxins, social isolation and self-damaging behaviours, which are typically observed in poorly housed populations where inequality exists, and all have been linked to poor health.¹ Most of the studies, however, conclude that housing plays an integral role in the improvement and maintenance of health. "Healthy housing" covers the provision of functional and adequate physical, social and mental conditions for health, safety, hygiene, comfort and privacy.² Moreover, the local environment is also important in that it can provide a safe and secure neighbourhood; promote social interaction and access to local services and facilities.

This relationship between health and housing is particularly relevant to the Healthabitat/CHDS Village Sanitation Project in Nepal. This project, which aims to improve health through improvements to the living environment, embodies many of the core principles of Healthabitat and the Housing for Health approach undertaken in Australia. Healthabitat's Housing for Health programme, initiated in 1985, works to improve the health of Indigenous people in Australia, by ensuring they have access to safe and well functioning housing, an improved living environment and are able to carry out healthy living practices. Healthabitat and its local partner CHDS Nepal work closely with participating villages to remove waste safely by building water, toilet and waste systems, as well as developing local community capacity in all stages of the project - budgeting, planning, design, construction planning, construction and evaluation. Biogas is produced from toilet and animal waste to provide a free, clean source of cooking fuel, reducing the indoor smoke from cooking fires that leads to high rates of respiratory illness, as well as addressing wider environmental concerns.

This collection of background papers builds on your own work experiences and knowledge on housing-health linkages, and presents your perspectives on how improved housing and living environments contribute to improved health outcomes in disadvantaged communities. A session will be organised in Nepal for us to exchange around this issue further. We look forward to our discussions in Nepal, and we hope that you enjoy reading about each other's work in the meantime!

¹ Phibbs, P. & Thompson, S. The health impacts of housing: toward a policy-relevant research agenda, Australian Housing and Urban Research Institute, 2011.

² Kılınç, V.S. et al., Relationship between Housing and Health, International Journal of the Humanities, Volume 6, Issue 1, pp.267-272.

Housing for Health: Improving the Living Environment and Health

Paul Pholeros, Healthabitat, Australia

For over 27 years, the Housing for Health programme has improved the health of Indigenous Australians by improving their living environment. The work has focussed on sustaining people, particularly children through the first five years of life. As the work progressed, it became clear that to achieve long-term gains in health, existing houses had to be improved immediately to ensure function. Then all houses, new and upgraded and the surrounding living environment had to be designed, constructed and maintained so that the health functions essential to residents could be sustained.

Healthabitat's³ Housing for Health programme has proven that immediate action, improving houses on the first day of every project, not only improves houses but also builds community trust. This immediate fix work, guided by health and safety principles, also provides the detailed data essential for guiding the longer and more complex design and planning process.

The safety and health principles are called Healthy Living Practices (HLPs) that were developed using local, national and international health data. They directly link and prioritise the many essential parts of the living environment to their health impacts. These principles have been regularly improved and refined since 1985.



Healthy Living Practices

From top left

- 1 Washing people
- 2 Washing clothes and bedding
- 3 Removing waste water safely
- 4 Improving nutrition, the ability
- to store, prepare and cook food
- 5 Reducing the negative impacts of over-crowding
- 6 Reducing the negative effectsof animals, insects and vermin7- Reducing the health impacts ofdust
- 8 Controlling the temperature of the living environment
- 9 Reducing hazards that cause trauma

³ Healthabitat Pty Ltd is a private Australian company with a director's agreement to act as a social business returning any profits to the projects.

Since 1999, the Housing for Health programme has been used in 188 communities around Australia improving over 7,500 houses for over 45,000 people. Since 2005, the principles and methodology have been used internationally in rural Nepal and urban New York City, USA.

The Housing for Health methodology includes a detailed 250-point survey test and check of each house and immediate fix work that improves houses from the first day of every project. This builds community trust and allows access to all houses. Local community employment is a key part of Housing for Health projects. Local people learn how to thoroughly test and check each house. Local teams learn to complete basic fix work, data entry, management of the project as well as community liaison and training.

Currently 78 per cent of all staff are local Indigenous people. This has meant significantly better targeting of project budgets and skilled, local teams to continue ongoing housing maintenance and management.



Local staff are involved in all aspects of every Housing for Health project.

An onsite database uses the Healthy Living Practices to prioritise all initial urgent fix work. The data is then reused to accurately determine the more extensive upgrade works completed over the yearlong duration of each project.

A national database consolidates the data from each project to inform national indigenous housing and health policy and research. The data from 7,500 houses highlights where better design is needed, for example: taps, hot water systems, wastewater disposal systems and light fittings.

Medically proven health gains have been achieved for a relatively minor investment in house fix work. Health monitoring of 71 Housing for Health projects, involving 2,230 houses occurred over a 10-year period. There was a 40 per cent reduction in hospital admissions for serious environment related illnesses. This significant improvement in health was achieved for an average investment of \$AUD11,000 (US\$11,361) per house.⁴

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 ⁴ Closing the gap: 10 Years of Housing for Health in NSW, An evaluation of a healthy housing intervention.
SHPN: (EH) 090090 ISBN: 978-1-74187-345-0. Aboriginal Environmental Health Unit, Population Health Division, NSW Department for Health

Case Studies

1) The prefabricated shower, laundry and toilet module.



The highest priority Healthy Living Practice is the ability to wash a child at least once a day.

Many parts of the living environment have to function to ensure a child can have a wash.

In desert areas, water may have to be pumped from a depth of 300 metres below ground, piped several kilometres, stored in tanks then piped to each house. Residents access the water via working taps and some of the water will be heated. Mineral salts in many areas of Australia corrode hot water systems and the wrong hot water system will last only a few months. Energy monitoring has shown over 70 per cent of the energy costs of a house will be spent on hot water. After use, the wastewater will be drained away from the house safely, treated and re-used in the surrounding environment for growing trees for windbreaks or firewood.

To wash the child and sustain health, all the parts in the chain above must function efficiently and require low maintenance. In remote areas, the cost of licenced trades required to build or renovate washing facilities (plumber, electrician, floor finishers) makes the work prohibitively expensive and construction quality is hard to achieve. These issues combined led to the design of a prefabricated shower, laundry and toilet module to address the three highest priority Healthy Living Practices. The module was designed to be built in regional centres and then transported and fitted to existing houses or form part of any new house.



The prefabricated shower, laundry and toilet module was designed and built to address the three highest priority Healthy Living Practices

Design features of the prefabricated module include a precast, pre-tensioned concrete base to reduce corrosion by high mineral salt water. The hot water systems used vary depending on climate: solar units used in desert areas and heat pump units in tropical areas where the sun may be limited by wet season cloud build up. Water leaks deplete precious supplies and if a hot water tap leaks energy is also lost. Leaking water taps increase the load on the waste water system. All pipework, valves and taps are selected to resist the impacts of mineral salts and reduce leaks.

The laundry area integrates a baby-washing tub. The toilet is a low flush cistern (3/6 litres) and all tap ware and pipework can be easily accessed for maintenance from a central service area. A reverse osmosis water filter, powered only by mains water pressure, is included in each module when water quality is poor. This provides around 8 litres of potable water daily to the kitchen area of the house.

All parts of the module are monitored to assess performance.

2) Removing waste safely and improving nutrition in Nepal

When asked to provide toilets for a village of 450 people in Nepal, Healthabitat offered immediate, but limited action, by designing and constructing two proto-type toilets. The design detail of the proto-types used local materials and the capacity of local people to be involved in all aspects of the project.

During the design of the proto-type toilets, it was also noted that water in the village was scarce and that cooking gas had become very expensive and the local alternative for poor villagers was to use green timber. Cooking on smoky fires in enclosed houses led to high levels of respiratory illness and the impact on the steep terraced environment of this timber use was land erosion.



The toilet design and biogas system

These factors all influenced the final toilet design. Each toilet collects rainwater in a 500-litre rainwater tank for the ½-litre dip flush system and hand washing. Each toilet includes separate flush and hand washing taps, insect screening, clothes hooks and a cleaning brush. The toilet waste is combined with animal waste and treated in a biogas digester. This produces 3-4 hours of clean, smokeless methane gas for cooking every day and allows the remaining treated waste to be used as crop fertiliser.

Fifty-eight toilets completed the project in the first village and the construction team is now training two more villages. The ongoing construction process is fully managed by Nepalese people. Skills learned, and wages earned, by the local teams sustain their families and the toilets remove waste safely as well as providing cooking gas to improve nutrition.

Poor families and communities, usually with limited access to designers or architects, need sustainable design to improve both their living environment and health.

Integration of Water, Sanitation, Hygiene and Indoor Air for Healthy Life: An approach of SWASHTHA project in Nepal

Binaya Raj Shrestha,⁵ Practical Action, Nepal

Water sanitation related diseases and indoor air pollution (IAP) are amongst the top killers in Nepal attributing to more than 10 per cent of death causes annually. 14,700 people are dying every year from diarrhoeal disease due to unsafe water, lack of sanitation and unhygienic behaviour. Another 7,500 people are dying each year due to IAP, a kitchen killer. Among these deaths, more than 50 per cent are of children under five years of age – around 12,700 children under five die annually from both diarrhoeal and acute respiratory infection (ARI) diseases. About 10 billion Nepalese Rupees (US\$11.62 million) are lost annually because of poor hygiene and environmental sanitation and there is another estimate of the same amount that is lost annually to due to IAP.

SWASHTHA Project

The SWASHTHA (Strengthening Water, Air, Sanitation and Hygiene Treasuring Health) project is therefore designed to contribute to reducing such losses through integrated WASH interventions in some urban and peri-urban areas of Nepal. The project aims to improve the health and well-being of the urban and peri-urban settlements of Bharatpur, Butwal, Gulariya and Tikapur municipalities and is being implemented in 19 communities in these four municipalities and two Village Development Committees (VDCs) of Chitawan district. The SWASHTHA project also focuses on the few urban environmental problems of some neighbouring municipalities and small towns such as Ratnagar, Ramgram, Sidharthanagar, Sunawal, Bardaghat and Kawasoti. It is a four-year (2009 - 2012) project funded by the European Union under its Non-State Actors in Development (NEPAL) programme and co-financed by UN-HABITAT's Water for Asian Cities Programme. The project's implementing partners are the Municipal Association of Nepal (MuAN), Environment and Public Health Organization (ENPHO) and Practical Action Nepal Office as Non State Actors (NSA) and respective municipalities and VDCs as State Actors. The overall objective of the project is to improve health and wellbeing of vulnerable population, especially women and children, residing in urban and peri-urban communities of the project areas. The expected outcomes of the project are to reduce health costs through preventing WASH related diseases, creating a clean environment and promoting improved hygiene practices.

⁵ Binaya Raj Shrestha is the Project Manager of Urban Water Sanitation and Waste in Practical Action in Nepal. Due to a conflicting work schedule, he could not join the study visit but has kindly sent his written contribution to share with the group. He can be contacted at <u>binaya.shrestha@practicalaction.org.np</u> for questions or comments on his paper.



An integrated approach of SWASHTHA project

Project Components

Safe water is the first component of the project. Water should not only be safe at source but also until it is consumed. It is therefore important to deliver safe drinking water from its catchments to consumers (*"in Nepali Mul Dekhi Mukh samma"*). Low cost household water treatment options such as boiling, chlorination, filtration and SODIS (solar disinfection) methods are promoted in the project communities. Concrete platforms are constructed to aid ground water source protection.

Better sanitation is the second major component of the project, with sanitizing faeces as a key facet. The project promotes low cost toilets as per the choice of households including single pit pour flush, wet ECOSAN, dry ECOSAN and bio gas attached toilets. Moreover, dish-washing platforms (*Juthelno*), dish drying racks (*Chang*) and cattle shed improvements are also promoted for better health outcomes. The use of local resources has been encouraged while promoting such interventions.

Hygiene is the third component of the project. Local change agents such as Female Community Health Volunteers (FCHVs), teachers and students are trained and mobilized to raise awareness of safe hygiene practices.

Kitchen management is the fourth component of the project. Major project interventions to reduce IAP are the promotion of improved cooked stoves (ICS), ventilation improvement, biogas, and kitchen space management.

The fifth component of the project is **waste management**. The project has promoted the 3R (reduce, reuse and recycle) principle in managing solid waste of project communities. Household and community composting are some of the major interventions under this component.

Project Results

Access to safe water has increased. Two communities have been declared as being safe water communities (SWC). The project, with the support of local stakeholders, is able to declare open defecation free (ODF) in 14 project communities out of 21. Open defecation is also significantly reduced in other remaining communities. People have expressed that their hygiene awareness has increased and they have adopted safe hygiene practices accordingly. More than 300 FCHVs are trained on each component of the project and are mobilized in the project communities. The pollution level of indoor air in households involved in the project has reduced significantly. Similarly, awareness of waste management has also increased. Further, a community in Chitwan has been declared as SWASHTHA (Healthy) community after satisfactory interventions of all project components.

Changing people's behaviour is a complex and challenging process. The project has applied ignition participatory rural appraisal (IPRA) tools to trigger behavioural change. Despite the project's successes, five to ten per cent of the toilets are still not being used properly, some water filters are already not working, some people still do hand washing incorrectly, some installed improved cooking stoves are not being used and waste is not being managed properly.

Overall, however, there are visible positive changes in the health of people in the project communities such as reduction in diarrhoeal and smoke related diseases. FCHVs have expressed that the use of rehydration medicine (*Jivan Jal*) has reduced significantly in project communities. Communities are cleaner because of the reduction in open defecation and better waste management. It can be concluded that promoting these five components definitely help to create a healthy home and with these healthy homes, a healthy community develops.

Exact mapping of the project outcomes will be revealed in a health impact study carried out by an independent consultant. The study results will be measured against the baseline data taken before the project interventions in order to evaluate the project and will be available by November 2012.

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Steering Committee for National Sanitation Action, (2010) Sanitation and hygiene master plan Nepal

Practical Action in Nepal, (2010) Orientation book on effects of indoor air pollution for female community health volunteers

Building and Construction Improvement Programme

Qayum Ali Shah, Aga Khan Planning and Building Service Pakistan (AKPBSP)

Approximately 2.4 billion people, generally the world's poorest, rely directly upon biomass for their heating and cooking needs and this number is expected to increase to 2.7 billion in 2030. Today biomass accounts for 70 per cent of residential energy consumption in developing countries. People using inefficient biomass burning stoves and living in poorly ventilated, uninsulated houses pay a significant social and economic cost for it. Biomass linked Indoor Air Pollution (IAP) in developing countries ranks fourth in terms of the risk factors that contribute to disease and death (in Pakistan, this is 51 per cent).⁶ Women and children collect biomass, foregoing other productive work and education. While traditionally biomass was free, shortages are forcing its purchase, adding to levels of poverty. Already, the cost of biomass is around three to six per cent of total household expenditure in South Asia and Africa. Environmentally, biomass is the highest producer of carbon per calorific value of energy and a major reason for deforestation (which causes 25 per cent of the carbon accumulation) and black soot (which may be responsible for 15-30 per cent of global warming).⁷

Biomass can become an affordable source of renewable energy for the poor - much more than solar and wind - if its usage becomes more efficient and less harmful. This became the primary objective of AKPBSP's Building and Construction Improvement Programme (BACIP) when it was initiated in 1997 to improve the living conditions of the marginalized people of Northern Pakistan.⁸

Some of the core problems identified by the BACIP Programme during its diagnostic surveys were:

- cold, dark, damp, dusty and unhygienic in-house environment;
- poor and weak structures of the houses which required maintenance and which were susceptible to damage during earthquake, hence putting life and property at risk;
- lack of proper sanitation;
- high expenses and workload related to fuel wood collection and purchase;
- high degree of smoke and pollution inside the houses;
- heavy workload of women to complete household chores;
- high incidence of environment related diseases such as acute respiratory infection, pneumonia, eye soreness, etc.; and
- overall demoralizing living conditions which led to a feeling of utter poverty and hopelessness.

BACIP adopted a three-pronged sustainable approach of strategically bringing down the barriers to mass scale adoption of energy efficient products:

1) Field-based participatory and action research resulted in more than 60 different types of housing and living conditions improvement products and techniques. These include energy-efficient cooking stoves which also heat up water, with the same amount of firewood consumed for cooking the food, as well as techniques to improve building thermal efficiencies (four-product combination - roof hatch

⁶ http://www.health.gov.pk/

⁷ http://www.sciencedaily.com/releases/2001/02/010208075206.htm

⁸ http://www.akdn.org/akpbs_pakistan.asp

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window, cooking stove with water warming facility and floor insulation). At US\$ 115 per house these reduce consumption by 50-60 per cent and indoor air pollution diseases by 40-50 per cent). The use of these fuel efficient products and techniques have been instrumental in poverty alleviation through a reduction in fuel consumed for cooking food and heating space in the winters, as well as saving on the productive time of women with a reduction in the need for collecting and chopping firewood and travel time for washing laundry, which typically involved walking several kilometres daily to river banks.

2) BACIP regularly organizes road shows in remote villages where its products are displayed in the field to provide information to local communities about the benefits of BACIP products. Workshops for professionals and other institutions, as well as communities, are conducted in order to disseminate information about BACIP products and the processes for their assimilation.

Exchange visits are organized by bussing people from non-BACIP villages to BACIP villages where the energy efficient products are in use and the consumers are fully satisfied with the performance and benefits of the products. Radio talk programmes and TV tickers are also aired and broadcast for wide dissemination across the Gilgit Baltistan and Chitral (GBC) region of Pakistan.

3) Establishment of market-based mechanisms such as training of entrepreneurs for making/ selling products locally; appointing female sales persons in villages;

4) Developing linkages with a micro-finance institution;

5) An investment project under the Clean Development Mechanism (in process).

With the installation and adoption of more than 60,000 energy efficient products across GBC, approximately 255,000 people have benefitted and more than 135,000 tonnes of CO2 emissions are being saved annually.

BACIP is an award-winning programme in four ways - concentrating on the poorest; offering a wide range of products to reduce overall household energy consumption; targeting socio-economic benefits and adopting a sustainable programme approach.

BACIP programme has been recognized both at national and international levels and has won the following awards:

- ALCAN Prize for Sustainability, 2005
- World Habitat Award, 2006
- Energy Globe Award, 2008
- Global leadership Award for Clean Indoor Air, 2009
- Ashden Award for Sustainable Energy, 2011

Comprehensive Habitat and Healthy Communities

Joe Madiath and Chitralekha Choudhury,⁹ Gram Vikas, India

According to the Centre for Science and Environment,¹⁰ out of the last 100 years, Orissa has been disaster-affected for as many as 90 years through floods, droughts and cyclones. Each time a disaster strikes, the affected population has been set back by over twenty years, contributing to the cycle of poverty and under development. Early on Gram Vikas realised that development of habitat, rooted in enabling infrastructure and livelihoods, with the ability to withstand disasters would be key to breaking the orbit of poverty and launching into the spiral of development. Community managed development of the habitat is a significant instrument in bringing dignity in the lives of the rural poor and a means of building self-confidence and empowerment.

Products or Services

Gram Vikas creates sustainable habitat for poor communities on a 100 per cent inclusion of all families residing in a habitation. The habitat model consists of a 450 sq.ft (min.) house with two well-ventilated rooms and a front verandah, a kitchen with a smoke efficient stove, piped water supply, toilet and shower, allowing for basic minimum standards of privacy and comfort. The approach includes:

<u>Social mobilization</u>: Starting with series of discussions, Gram Vikas's entry into any village is subject to the community agreeing to make a financial commitment and creation of a *corpus fund* (average contribution US\$20 per household), with better-off paying more than the poor ones, enabling every family to obtain the same water supply and sanitation infrastructure. This step is the "acid test" of the motivation of the community. Men and women are encouraged to participate in the process of decision-making and implementation.

<u>Capacity building</u>: The community is trained and supervised to establish piped water supply, toilets and showers for each household. This is accompanied by (a) creating village level institutions, which take the responsibility for the water and sanitation system to begin with, and eventually overall development, and (b) livelihood enhancement activities such as masonry training, agro-forestry etc.

<u>Creating housing infrastructure</u>: All families who do not have quality housing are encouraged to take housing loans. As the banks are reluctant to give loans directly to the poor, Gram Vikas takes group loans and on-lend to them (between US\$400 – 800). The trained masons build the houses; the families contribute bricks, local materials, labour etc.

Innovation

Gram Vikas's habitat model is unique as it dispels the myth that poor people cannot afford quality solutions. It demonstrates alternatives to mainstream policies in Housing (Indira Awas Yojana) or sanitation (total sanitation campaign) which disregard the needs of privacy or dignity of poor people.

⁹ Joe Madiath is the Executive Director of Gram Vikas. Ms. Chitralekha Choudhury is Manager, Natural Resource at Gram Vikas. Information on Gram Vikas can be accessed at <u>www.gramvikas.org</u>

¹⁰ Centre for Science and Environment (CSE) set up in 1980 is an independent, public interest organization based in New Delhi, which aims to increase public awareness on science, technology, environment and development.

For example, the Indira Awas Yojana, where a rural poor family can build a single room house of 220 sq.ft., in which up to three generations must cook, eat and sleep. The very idea is repugnant to a civilized context. The uniqueness of Gram Vikas approach are:

- 100 per cent inclusion, where no family is left out irrespective of class and caste
- 60-70 per cent cost contributed by the family in the form of bricks, sand, aggregate and unskilled labour.
- Holistic approach which includes shelter, water and sanitation resulting in cleaner habitat
- Technical innovations in housing random rubble foundation with sand filling of gaps, Rattrap bond and mud mortar, filler slab roof saving 40 per cent concrete and 30 per cent steel, use of ferro-cement doorframes and doors instead of wood.

Delivery Model

No village is taken up for implementation unless 100 per cent of the households agree to be part of the water and sanitation programme, and the corpus fund is collected. Thereafter in a series of meetings, the plan is developed to undertake sanitation, water and thereafter housing in the villages.

<u>Enabling the poor to access housing finance</u>: Gram Vikas accesses housing loans for the poor (whom the banks do not finance directly) and on-lends to them, and for others, Gram Vikas facilitates the process of direct housing loans from banks.

<u>Utilizing local resources</u>: All households, who go in for houses, make bricks themselves and collect local construction materials. The process is slow and may take two years, but it takes the whole village along together and ensures that the poorest sections are not deprived of quality housing.

<u>Securing livelihoods for the poorest</u>: All unskilled labourers - girls and boys - are trained as masons, plumbers etc. who construct the toilets, showers, overhead water tank and houses in the village.

Financing

Gram Vikas facilitates loans for housing from financial institutions in the market. It receives loans from HDFC (Housing Development Finance Corporation) and on-lends up to Rs 25,000(US\$464) per family on the production of household details and the respective land titles (*pattas*). Given the income/ finance levels of clients of Gram Vikas, a loan size of Rs 20-25,000 (US\$372 - US\$464) is what they are able to manage and repay. Gram Vikas enters into formal agreements with the clients on the terms and conditions of repayment. There is an element of flexibility given the income patterns of the people – so it could be monthly, quarterly or seasonal repayment. The loans are to be repaid in 15 years. Gram Vikas uses the "credit cum subsidy" line under Indira Awas Yojana scheme to enable poor families who have taken a housing loan to avail a subsidy of Rs. 12,500 (US\$232). This gives them some repayment time especially when they are constructing their houses and find it difficult to pay due to reduced earnings.

For sanitation, Gram Vikas accesses government programmes and other funding sources to subsidise the cost of external materials up to Rs. 3,500 (US\$65) per family. For wells and overhead tank, government gives 80 per cent of the total cost. The balance is met by the people in form of labour and local materials.

Effectiveness

Efforts in comprehensive habitat have manifold effects on quality of life and standard of living of the rural communities. The entire village undergoes a transformation which bears a proud testimony to the collective spirit of the people. The immediate impacts of a comprehensive habitat programme are:

- The villages become open defecation free and there is safe disposal of human waste. This leads to safe and clean water, which results in 85 per cent reduction in incidence of water borne ailments such as diarrhoea, jaundice, scabies, worms and typhoid. As a result, families are able to save Rs.2,500-3,000 (US\$46 US\$56) in a year on medical expenses.
- Availability of water round the clock relieves women of the drudgery of fetching water. The time saved is used by most women in productive activities or to take better care of their children or even spare time for leisure.
- Permanent and disaster-resistant housing enables families to save Rs. 2,000-2,500 (US\$37 US\$46) annually on thatching and other repairs. It mitigates the effect of unforeseen calamities such as fire or cyclone etc.
- Youth who are trained as skilled masons are capable of earning three to four times what they used to earn prior to the trainings. They easily get employed in the infrastructure sector in the state or outside the state.
- The corpus fund mechanism ensures that the programme can be carried on even after Gram Vikas withdraws from the village. The interest generated out of the corpus deposit is used to support new families in the village to have their own sanitation infrastructure.

The comprehensive habitat model, which includes housing and water and sanitation, has been implemented for 3,630 families in 191 villages in Odisha. In another 800 villages, Gram Vikas has implemented water and sanitation projects. These initiatives have shown that provided the right kind of inputs even the marginalised communities – tribals and dalits – can help themselves to improve their standard of living. As a result of improved hygiene and clean water, there is a palpable improvement in health conditions of the people and an increased confidence to take action towards their development.

Working with Low-Income Communities to Improve Health and Well-Being: The case of Global Studio

Anna Rubbo,¹¹ Global Studio, Australia

Global Studio is an action research academic programme where international students, academics, and city building professionals come together to collaborate on community-based projects. Informed by the Millennium Development Goals, Global Studio promotes participatory design and planning education and practice that benefits under-served populations. Since its inception in 2005, some 600 students and academics from over 30 countries and 66 universities have participated in Global Studio's intensive programmes.¹² Participants have been drawn almost equally from the global north and south to its programmes in Istanbul (2005), Vancouver (2006), Johannesburg (2007-2009) and Bhopal (2012), thus fostering new north-south, and south-south relationships and understanding. On occasions Global Studio has 'reciprocated' community 'hospitality' by inviting grass roots community representatives to take part in 'first world' events such as the World Urban Forum or international exhibitions.

Global Studio grew out of the work of the UN Millennium Project Task Force on Improving the Lives of Slum Dwellers (2002-2004), and builds on the community enablement strategies of the early nineties.¹³ It also takes into account critiques that have been levelled against participatory processes in community development, and especially participatory rural appraisal (PRA).¹⁴

The work of Global Studio has been underpinned by the principle that communities should be subjects rather than objects of planning, and that decision-making should rest with community-based organizations. As such, Global Studio has tried to respond to community needs, with the aim of building local capacity, providing access to the knowledge and tools of design and planning research, and has assisted with the development of some income generating projects in communities. Global Studio has also focused on creating an international network of future citizen professionals that will be better able to address social and environmental sustainability in disadvantaged communities. Adopting a paradigm of an engaged but bottom-up multidisciplinary, multi-institutional and international education practice, Global Studio has provided an innovative model of international design and planning education and community engagement.

¹¹ Anna Rubbo is an Adjunct Senior Scholar of Center for Sustainable Urban Development in The Earth Institute and founder of Global Studio. She can also be reached at anna.rubbo@columbia.edu for questions or comments on her paper.

¹² A more in-depth discussion of the theory and practice of Global Studio can be found in Rubbo, A. (2010) "Towards equality, social inclusion and human development in design education: the case of Global Studio 2005-2008", *Architectural Theory Review*, Vol 15:1, pp. 63-85; also Rubbo, A. ' Design Education as Engaged Practice: Going 'Live' at Home and Abroad' in *Live Projects: Designing with People*, Dodd, M., Harrison, F., Charles worth, E, (eds.) Melbourne, RMIT University Press, 2012. See <u>www.theglobalstudio.com</u> for project information, films, exhibitions, resources etc.

¹³ See Burgess, R. Carmona, M, Kolstee, T. (1997) *The Challenge of Sustainable Cities: Neoliberalism and Urban Strategies in Developing Countries*, London, New Jersey: Zed Books, p. 151. See also Chapter 9, "Contemporary Policies for Enablement and Participation: A Critical Review", pp 138-161

¹⁴ Cooke, B. and Kothari, U. (eds.) *Participation: the New Tyranny* (Zed Books, 2011) critique grass roots participation, especially as it deals with power relations and local knowledge. While it makes a contribution an important debate, the book does not provide many alternatives. See also Pratt, G. 'Practitioners' Critical Reflections on PRA and Participation in Nepal', *IDS Working Paper 122*, 2001 (on-line).

The Global Studio approach begins with a number of broad questions to the community, which in turn help generate research questions, and areas for action. The suggested starting questions for beginning a community dialogue are:

- What do you like/dislike about where you live?
- What would make life better?
- What physical changes might make life better?
- Do you have a vision for the future?
- What are the planning and political constraints?

The various projects described here emerged from these questions as well as observations about community needs, and Global Studio participants worked with people to understand what their issues were and how they might be addressed. This act of understanding, as well as the skills of participatory observation and 'listening' is a key plank in the educational aims of Global Studio as it attempts to impact the next generation of urban practitioners.

Examples

This section focuses on Global Studio engagement in South Africa, which began in 2007 and continued through 2009. Since then on-going work has been carried out by the NGO Sticky Situations,¹⁵ established to support the projects and initiatives begun by Global Studio and local actors. Dieplsoot is a township of 160,000 people on the edge of Johannesburg. The projects include initiatives to improve health and well-being through housing improvements, a drain and toilet upgrade by Global Studio and the cooperative WASSUP, and the development of a formally constituted arts group - DACN (Diepsloot Arts and Culture Network) which also engages in housing, health and sanitation issues through direct action and 'edutainment'.

Project: Housing Improvement

The majority of Diepsloot residents live in small corrugated iron shacks. Protected from the weather by a single sheet of corrugated iron for roofs and walls, people experience temperature extremes. Global Studio listened to the complaints about excessive heat or cold, and experimented with roof insulation, developing a cheap and easy to install a system of insulation, which provided some relief.¹⁶ With some training, local people were able to complete their own insulation.

Project: WASSUP and the sanitation upgrade

Leaking drains and defective toilets are common throughout Diepsloot, but are especially acute in the densely populated 'reception area'. Over three years Global Studio worked with residents, local government and the Johannesburg Development Agency (JDA) to make improvements, bringing together the tools of design thinking and research, new technologies, local knowledge and skills, and

¹⁵ See <u>www.stickysituations.org</u> established by Global Studio project manager Jennifer van den Bussche.

¹⁶ Shack insulation commenced in 2007 in Alexandra Township, followed by a programme of training and installation in Diepsloot in 2008, involving DACN personnel. See also the student made film, Small change, big difference' at <u>www.theglobalstudio.com</u> >features>films> 'An evaluation was carried put in 2009 to establish levels of satisfaction, and internal and external thermometers were placed in shacks for a six month period, with readings taken by residents, to record the internal /external temperatures. Satisfaction levels were high.

International Study Visit to the Healthabitat/CHDS Village Sanitation Project, Nepal

city funding. The outcomes provided improvements in health and well-being, some new jobs for local residents, and importantly built confidence and empowered people. There are two parts to this project.

a. Leaking drains

With the installation of prefabricated concrete toilets with a water faucet fixed to the toilet wall above a semi-circular drainage area, leakage has been a common problem. The problem is part cultural, part design and part technological. People eat a lot of pap, a glutinous food made of corn. They then wash their plates and pots under the tap, and the pap and other foodstuffs block the drain. The drain is not designed to cope with solid wastes, nor is it easy to keep clean. Through observation in 2007, followed by experimentation in 2007 and 2008, Global Studio devised a simple solution. Working with local residents, students created a double sieve by cementing an easily available plastic paint bucket over the drain. They then inserted another plastic bucket that catches the pap and other waste. With holes drilled in each bucket, it provided an effective double sieve system that helped alleviate the leakage in the streets. Implementation began in 2008, providing a cheap and practical ('bottom-up') solution to a problem that had been incapable of resolution by the ('top-down') regional planning department.

b. Toilet upgrade

With many families using a single toilet, the maintenance and upkeep of toilets had proved to be an intractable problem and a health hazard. Moreover, the large numbers of toilets in the reception area, and the difficulty of mapping them had discouraged any comprehensive assessment by the City. The issue was researched by Global Studio with local residents in 2008, and presented to city authorities. The Johannesburg Development Agency saw possibilities for Global Studio to assist with an upgrading programme, which they did not have the capacity or resources to pursue. The solution arose from a 'bottom-up' approach, which suggested physical solutions to a problem but also a process for implementation that would engage those most concerned with the negative impacts of faulty toilets.

In 2009, Global Studio employed GIS technology to map toilets in the reception area and at the same time document defects, and what would be required to repair each toilet. This information became the WASSUP (WC, Amenities, Sanitation Services, Upgrade Programme) manual, and provided the basis for the current upgrading programme.¹⁷ In 2010, the WASSUP- Global Studio collaboration was selected for the exhibition 'Design with the other 90 per cent' held at the United Nations in New York over three months. In line with Global Studio's philosophy of reciprocity, two township representatives attended the New York exhibition opening and gave talks at Columbia University and Parsons School of Design.¹⁸

Project: Arts and Culture - DACN

Global Studio turned its attention to community arts and culture in 2008, and organized some community meetings. There was plenty of evidence of creativity, from the sculptures made from car

¹⁷ Using GIS, 218 concrete and portable toilets were located and students produced two manuals: WASSUP Structural Manual + Training Handbook, and the WASSUP Plumbing Manual + Training Handbook.

¹⁸ Design with the other 90per cent, <u>http://www.designother90.org/cities/home</u>

parts, to the wire toy making by children, the occasional finely worked gardens and decorated shacks, the vibrant signage throughout the township, and the energy devoted to music and dance. With encouragement and some assistance from Global Studio, the group successfully applied for Not-for-Profit status in 2009 and is now a viable and creative organization, offering annual festivals on Mandela Day, diverse arts programmes as well as theatre 'edutainment ' on areas such as waste disposal and sanitation. In 2009, Global Studio made a film to promote hip-hop artists, a group that also engages youth in activities with a view to providing healthy role models.¹⁹ Recently, the arts and culture network and local children celebrated WASSUP's achievements by painting over 40 of the upgraded toilets.

As DACN activities expanded, the need for a physical space grew. Consulting with DACN members, Global Studio developed a three-stage design proposal for a refurbished building to house arts and culture activities, the proposed community radio station and a University 'shop front'. The shop front concept emerged out of discussions with the community development worker and ward councillor and was a key strategy in the design proposal. While appreciative of Global Studio initiatives and its commitment over a three-year period, local government would have liked a continuing relationship with local universities.

Recommendations and Considerations

Approaching community development from an interdisciplinary perspective can lead to valuable processes and outcomes. The university – community collaborations Global Studio has engaged in since 2005 provide some lessons, and these are offered as points for consideration.

- 'Communities' (NGOs, CBOs, local government) can benefit from working with universities on design and planning issues provided that the engagement is mutually beneficial and inclusive, and involves trust, respect and a commitment to useful and relevant outcomes.
- Communities need to be wary of being used as an academic 'laboratory' where expectations are raised without sufficient benefits which might be practical, educational or capacity building, while keeping in mind there are limitations to what universities can do.
- Universities need to consider how their work can be sustainable, and what mechanisms can be put in place to ensure this. (e.g., the university 'shopfront' concept; on-going work with NGO, e.g., Sticky Situations).
- The cultural exchange between communities and emerging urban practitioners can be of significant value in creating understanding as well as new knowledge and skills.
- Collaborations need to be well documented and evidence-based; outcomes and lessons learned should be disseminated to community and other stakeholders.
- Reciprocity between academic and community actors must be considered.

¹⁹ DIEP Salute , an 8 minute film. See <u>http://theglobalstudio.com/diep-salute/</u>

Design as a Necessary Tool for Improving Health Outcomes at the Household Level

Peter Williams, ARCHIVE Global, United States of America

Six diseases are responsible for 90 per cent of all deaths from infectious disease.²⁰ At the same time, by 2030 we expect that 1.8 billion people will be living in slums.²¹ What is the connection? This fundamental question illustrates the linear and too often silo approach that has come to dominate development discourse. The fact is, overcrowded living environments where residents lack access to clean water and suitable sanitation poses various and significant health risks. Environmental interventions will likely have a great impact on improving the health of residents in such settings (WHO, 2006). Specifically, the reduction of diseases associated with poor sanitation and poor cooking environments will simultaneously improve the health and the lives of urban slum dwellers (ibid). With our world population expected to double in cities and towns over the next 40 years – *what should a bold urban health agenda look like for the most vulnerable people on our planet?*

More than half the world's population now live in cities and the population living in urban areas is projected to increase from 3.6 billion in 2011 to 6.3 billion in 2050 (United Nations, 2012). Over the next 10 years, it is estimated that about eight million of these will move annually into informal settlements (UNHABITAT, 2010). The urban health response to this challenge seems overwhelmingly to prioritise healthcare - investment in infrastructure development such as hospitals, clinics and allied facilities. However, in aiming to meet the demand for institutional health care delivery, we have consistently seen that this is both resource-intensive and often disproportionate in coverage. In India, where there are approximately 860 hospital beds per million population, it was estimated that an additional 450,000 beds were needed by 2010— costing an estimated US\$25.7 billion (Price Waterhouse Coopers, 2007). This has not been met.

If it were even possible to construct enough health facilities to meet demand, we would be forced to consider that the existence of services and physical proximity does not necessarily correlate with access or use of these services. This is especially true among the urban poor who are excluded from decision-making, secure tenure and legal protection as well as experiencing discrimination and lack of sense of entitlement, making essential services, which is also often of lower quality then what is available to the rest, beyond their reach (UNICEF, 2012).

Yet despite these known limitations, why do most government-led approaches and multilateral agency agendas continue to sideline household or localised preventative urban health strategies? In recent years – incentivised by the climate change agenda – urban design/planning has formed an increasing part of the public health discourse within many industrialized countries. One such example can be found in the WHO Healthy Cities Network – a grouping of over 1000 cities in which healthy urban design is listed as one of its three core themes.²² Design is also suggested as a catalyst in tackling non-communicable diseases such as obesity through appropriate spatial planning to encourage physical activities (WHO, 2006). While there is no denying the impact of design on cardio-

²⁰ http://www.who.int/infectious-disease-report/pages/grfindx.html

²¹ http://www.dfid.gov.uk/Documents/publications1/cities-new-frontier.pdf

²² http://www.euro.who.int/en/what-we-do/health-topics/environment-and-health/urban-health/activities/healthycities/who-european-healthy-cities-network

vascular disease prevention, the burden of infectious disease – particularly though not exclusively in low-income countries - warrants the same if not more attention. The impact often falls disproportionately on the most productive members of society – those 18 to 40 years old. When observing the challenge locally, particularly at the community and household level, we see an abundance of proven examples in which housing (design) improvement interventions have yielded improved health outcomes. Cities such as Venice, London, New York and others have each benefited from improved population health resulting from improved living conditions. In fact, as Thomson et al (2009) has demonstrated, there is at least 100 years of evidence highlighting the co-dependent relationship between the two. The three examples below aim to further highlight this nexus.

Firstly, the *Firme* project in Mexico (Fundación Cidoc & Sociedad Hipotecaria Federal, 2011) serves to show how impact investments made at the household level can result in the improvement of living conditions and health simultaneously. For over 10 years, the Mexican government embarked on replacing dirt floors with cement (at cost of US\$150/household) and offered up to 50 square meters of cement flooring, while households contributed labour (sweat equity). The programme yielded demonstrable and positive effects on child health including a 78 per cent reduction in parasitic infestations, 49 per cent reduction in diarrhoea and 81 per cent reduction in anaemia among children. Results also showed a 36 to 96 per cent improvement in cognitive development as well as significantly improving adult welfare measured through increased satisfaction with their housing and quality of life, combined with significantly lower rates of perceived stress and depression (Cataneo et al, 2009).

Secondly, the country of Haiti even prior to the January 2010 earthquake endured the dual burden of poor living conditions and high prevalence of communicable diseases. According to Alkire & Santos (2010), in Haiti 35 per cent lack paved floors, 36 per cent lack clean water and 53 per cent lack sanitation. At the same time, the tuberculosis (TB) prevalence was 303/100,000 making it the highest burden country in the region while more than 95 per cent cooked with solid fuels contributing to almost 4,000 needless deaths annually (WHO, 2009). The commonality here is the intersection of poor living conditions, high TB prevalence and cooking with biomass fuels, which have been shown in studies (Padilla et al., 2001 & Pokhrel et al., 2010) to increase the dual burden of indoor air pollution and Tuberculosis disease. In 2010, ARCHIVE Global launched its Kay e Sante nan Ayiti (Housing and Health in Haiti) project by encouraging almost 1,600 participants from over 20 countries to consider ways in which improved housing design could reduce the risks associated with TB transmission and indoor air pollution (IAP) simultaneously. Based on our literature review, such a challenge had never been set before despite wide acceptance that both IAP and TB are respiratory diseases - and both are heavily influenced by environmental conditions. Gannon et al (2007) and Lever et al (2000) have argued that airflow and relative humidity (RH) are key environmental factors for TB transmission risk indoors. Slight changes in RH have a significant impact on the survival rate of airborne TB pathogen. A 1.6 per cent drop in humidity significantly decreases the lifespan of TB pathogens and thus the potential for infection. At 74 per cent, pathogens survive for 40 minutes (Lever et al 2000) and at 75.6 per cent pathogens survive for 540 minutes (9 hours) (Gannon et al., 2007).

ARCHIVE Global's project utilised environmental engineering strategies such as those outlined above and is currently in phase two of its pilot project in Haiti. This phase uses the format of an intervention study to demonstrate the impact on more than 65 individuals. The performance measurement strategies include pollutant monitors and data loggers as well as personal health diagnosis. Results are to be confirmed in 2015.

Thirdly, in Cameroon, where malaria accounts for 40 per cent of deaths among children under five (CCAM, 2009) and where 80 per cent of settlements in the capital city are informal (Sietchiping, 2005); preventative strategies that use improvement in housing and environmental conditions to control the spread of malaria are urgently needed but sadly overlooked. On World Malaria Day (April 25th) 2012, ARCHIVE Global with support from the Center for Disease Control and Prevention (CDC) along with other partners launched *Construire La Prévention Du Paludisme* (Building Malaria Prevention). The aim, like Kay e Sante nan Ayiti was to challenge a global audience of health and design professionals to consider ways in which housing design improvements could reduce the risk of disease. In this case – Malaria: Over the course of 36 months, the project will provide improved living conditions and reduce exposure to malaria among 264 families in Yaoundé, Cameroon. The premise of the project can be found in earlier studies (Gamage-Mendes et al, 1991; Kirby et al 2008; Lindsay & Snow 1988; Lindsay et al 2002) demonstrating the effectiveness gained in malaria control by improving living conditions. The project is underway and results are expected in 2015.

At the same time, others have argued that that there is still insufficient data to robustly support the types of wide-scale interventions described above. One expert on housing finance was quoted as saying, "Housing can have health-improving qualities, but we do not know how much 'better housing' results in 'better health'" (Lite, 2011). While Ryan Cherlin – a spokesman from USAID stated, "While there are undoubtedly correlations between poor housing and ill health, our health programmes focus on specific diseases and health services. Allocating global health funds for housing purposes would violate current legislation." (*ibid*)

While there is little dispute about the dearth in robust data from longitudinal studies to show the impact of housing design improvements on health – it is at the same time short-sighted and likely irresponsible to ignore what evidence does already exist. Building upon research, supporting multi-sectoral approaches and supporting bold leadership are among some of the key ingredients needed to foster the kind of paradigm shift in which we will see housing and health forming part of a paired agenda in development. Acting locally while thinking globally is certainly applicable here.

It is worth mentioning that at the time of writing, the Clinton Global Initiative has just completed their annual gathering of delegates from around the world. For the first time in the organisation's history, the theme 'Designing for Impact' shed light on the role of the built environment in tackling some of the most important development challenges of our time.²³ This move is inspiring to many of us working in this sector as it is hoped that the spotlight can now be shone on the importance of improving living conditions - particularly while realising the added benefit gained in improved health outcomes.

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The Plantation Workers in Sri Lanka

Sumathie Sivakumar, Sewalanka Foundation, Sri Lanka

The Sewalanka Foundation is a non-profit organization that works to empower the rural population all over Sri Lanka. We work with the rural and marginalized groups in the Sinhala and Tamil communities in 22 districts. We aim to improve the education, social and economic well-being, sanitation and environment of disadvantaged communities through capacity-building and awareness-raising programmes to improve their quality of life.

Our Nuwara Eliya District Office is situated at Norwood and we work with plantation communities in 35 divisions.

Plantation Background

In the 1980s, the British brought Tamil people from South India to Sri Lanka to clear the upcountry forests and work on the coffee, tea and rubber plantations. The workers lived on the estates and the plantation companies were responsible for providing social services such as housing, water and healthcare. These plantation workers became dependent on their employers for many of their basic needs and with limited opportunity to interact with other communities they became socially and economically isolated from the rest of the country.

There are approximately 900,000 descendants of these plantation workers in Sri Lanka, and most of them still live and work in the 448 tea estates in the central highlands where they tend to be confined within the area. Their living conditions inside the plantations vary depending on which company owns and manages the estate, but overall the socio-economic indicators for these communities are among the lowest in the country. It is difficult for people living in the plantations to access information, educational opportunities, markets and other jobs and only 19 per cent of young people complete secondary education.

The daily wage is 380 Sri Lankan rupees (less than US \$4) with incentives based on performance and attendance. A number of expenses are automatically deducted from each worker's payment. Salaries are paid on the tenth of each month, but most workers get a salary advance on the 25th. During the peak season, a person might be able to work for 24 to 25 days and earn 7,000 to 8,000 Sri Lankan rupees (US\$54 to US\$62) for the month. At other times of the year, the salary advance and the deduction cost may be greater than the total earnings that the plantation worker would owe the company money at the end of the month.

Housing, Water and Sanitation Issues

Most of the plantation workers live in line houses of only 100 square feet, with 10 foot by 10 foot rooms and a veranda. There are usually 5 to 15 families per line and it is common for families of six people to share two rooms. The workers also put up temporary sheds with mud walls which they use to prepare their meals and store firewood in. However, these sheds are difficult to use during the rainy season and as they are provided with temporary electricity connections, they have contributed to a number of fire accidents and are a safety threat to the workers.

Most of the people use firewood to cook their meals since they could get the firewood from the nearby forest or use the prunings of the tea bushes for firewood. However, the smoke and fumes from burning firewood contribute to respiratory diseases among adults and children. The waste water also stagnates in the drains; consequently there is a possibility of contracting dengue fever, a dangerous disease transmitted by mosquitoes.

Though Sri Lanka is surrounded with water, there is an acute shortage of drinking water, meaning that people have to walk one to two kilometres searching for water. In some areas people have to store rainwater for drinking purposes, while in some areas people have to make tube wells for their drinking water. Water management in the plantation community is also very poor. While water is provided by the plantation companies, the workers are not involved in maintaining the pipelines and due to lack of awareness, they do not make proper use of these resources. There is also a possibility of ground water contamination from the use of pesticides in the plantation fields, which could cause serious health problems among adults and children. Training and awareness in water management and protection of resources is very much needed in these communities.

Moreover, plantation workers still do not have access to proper water facilities and latrines. Some families were able to construct their own toilets, but those families who do not have the resources to build a latrine still use the jungle and drains for their sanitation needs. The schools in the area also lack proper toilet facilities that prevent young girls in particular from attending classes. Though the Plantation Human Development Trust is looking after the welfare of the community, the sanitation problem still remains a huge issue.

The malnutrition rate is also very high among the plantation sector population. Most of the families mainly depend on wheat flour as the basis for their meals for the whole day, since due to low incomes and high food prices, they cannot afford to buy sufficient, safe and nutritious food to meet their dietary needs.

Training

Sewalanka Foundation enhances the capacity of rural communities to democratically identify and address their own development needs and provides services that contribute to the economically viable, socially just, and ecologically sustainable development of Sri Lanka. Below are some of the training and support services that Sewalanka Foundation offers and provides:

- Transmission of water borne disease
- Water disinfection
- Latrine usage
- Hand washing practice
- Disposal of children's waste
- School latrine maintenance
- Water and food preservation
- Kitchen waste
- Home gardening nutritional vegetable cultivation
- Organic vegetable cultivation
- Environmental protection

- Monitoring health status infectious diseases (diarrhoea – tuberculosis – malaria)
- Chemical (pesticides) mixing near spring and water tank
- Gender
- Women empowerment
- Book keeping
- Teenage pregnancy
- Child abuse and domestic violence

Integrated Socio Economic Development

Mehrunissa Hashmani, Aga Khan Planning and Building Service Pakistan (AKPBSP)

"The connection between health and the dwelling of the population is one of the most important that exists." Florence Nightingale

The environment in which people live affects every aspect of their lives, including their health, economic activity and psychological development. Moreover the link between the environment and health was directly established by Agenda 21 of the World Health Organisation. Environmental health factors account for 21 per cent of the overall burden of disease worldwide in which 30 per cent from that proportion come from indoor smoke and 48 per cent from unsafe water and sanitation. Indoor air pollution, lack of sanitation and unsafe drinking water are some of the key factors drastically affecting the quality of our lives and the lives of our children. The challenges of a high burden of disease in less developed countries become even more pronounced due to the lack of health facilities and high cost of health care. Families who are unable to manage these expenses fall into a chronic cycle of poverty fuelled by ill-health, low economic opportunities and mounting debt.

The lack of safe drinking water and sanitation alone has multi-dimensional consequences for families, as women are the primary water carriers in the family. They are forced to walk for hours every day to bring water exposing themselves to numerous risks. The lack of latrines mean these women often have to wait till the fall of darkness to relieve themselves in open fields. Both sanitation and indoor air pollution are the major factors in the high burden of disease. Therefore improvements to people's immediate built environment enable an integrated improvement in the quality of their lives.

Context

According to the Prince Karim Aga Khan IV

"...the visual, physical and emotional impact of a decent home can light the spirit of human endeavour. A proper home can provide the bridge across that terrible gulf between utter poverty and the possibility of a better future."

This statement identifies the often ignored principle that safe, healthy, comfortable, cost-effective and environmentally-friendly living conditions can significantly improve health indicators and also provide an invaluable respite from poverty. Based on this vision, a series of studies were conducted in the late 1980s by the Aga Khan Development Network in Pakistan, and a profile was developed for the mountainous regions and low lying coastal areas of Pakistan. The studies identified the following as some of the key challenges to economic development that are linked to the Built Environment:

<u>Fragile Natural Environment</u> – The people of the region were at constant risk of natural hazards such as flooding, avalanche, debris flows and earthquakes. As a result of decades of prolonged mismanagement of natural resources, particularly natural forest cover and mangrove depletion for fuel wood, the incidence and severity of emergencies has risen dramatically. The reduction in forest cover has also led to an increase in vulnerability to the impacts of climate change, such as glacial lake

outburst floods such as the one in 2011 which has destroyed a number of villages in Gilgit Baltistan and the massive 2010 floods in Sind.

<u>Habitat Risks</u> – With movements away from traditional housing practices, new rural and urban homes are being built across the rural and urban areas in the regions using practices such as poor ventilation and insulation which, when coupled with inefficient biomass usage, have led to cold smoky homes and public facilities, which in turn has led to increased rates of acute respiratory infection, eye disease and a higher percentage of household incomes spent on fuel wood. The unavailability of safe drinking water and hygiene education has further exacerbated the socio-economic conditions of the local populations.

To address these needs, AKPBSP initiated integrated development programmes targeting improvements in the infrastructure and facilities available to the target populations. Infrastructure is defined as that which is provided from outside the individual's property and is available for the community along with the individual. It includes, amongst many others, water supply infrastructure, sanitation and sewerage lines, electricity supply, communication infrastructure, road linkage and open space for recreation. Facilities are defined as those which are available for the individual and are owned by the individual. These include heating, lighting and ventilation conditions inside the building, privacy and space within the house, and structural stability and durability of the structure.

The Project

After working with different programmes for achieving one goal "to improve quality of life" in 2009 AKPBSP initiated a pilot project in Sind integrating education, health and hygiene, water and sanitation, livelihood and civil society development intervention targeting the same community. The project has two primary goals: to ensure access to safe, risk-free housing with basic facilities which would be able to withstand floods, rain and other elements; and access to basic infrastructure, including amenities like proper ventilation, basic infrastructure like electricity, water, sanitation and roads. The major aspects targeted by the project are interrelated for achieving a better quality of life:

<u>Socioeconomic and cultural aspects</u>: Many people lack easy access to essential facilities like water, space to rest, toilets, fuel for cooking and heating etc. This can lead to demanding workloads, gender disparity, poor health conditions, heightened vulnerability to disasters and unending poverty

<u>Experiential aspects</u>: If provided with a reasonable home and essential facilities within their living environment, many vulnerable and poor communities can be inspired and motivated to sustainably improve their quality of life.

<u>Physical aspects</u>: Decent house extends beyond the enclosed structure of the house. It also includes adequate water supply and sanitation, access to energy and electricity, infrastructure for sewerage, roads, communication and more.

<u>Environmental aspects</u>: A good built environment is one that does not affect the natural environment negatively and provides opportunities for building secure and sustainable habitat for humans.

Like all social interventions, community involvement, motivation and participation are essential to sustainable progress. Over decades, a culture of dependence on hand-outs had developed creating

an atmosphere lacking in motivation to change. To ensure the sustainability of its intervention, AKPBSP set out to create a cohesive community, where open communication would facilitate conflict resolution and participation in village development. Community trust building activities were organized, such as cricket matches and workshops on savings, wealth management and basic accounting. AKPBSP ensured that the community participated in these activities.

Once the community has been mobilized and is capable of identifying their needs, AKPBSP started to address the area's built environment needs by working with the community to lobby the government for a gas connection. This was done to decrease reliance on biomass and wood for their cooking and heating needs. By coordinating with the other sister NGOs under the umbrella of AKDN, AKPBSP has been able to drive school attendance from 55 per cent up to 85 per cent, through regular checks on individual children's attendance. Some more rooms were also added to the school, now children graduating from eighth grade are travelling to the town area for higher studies. Health problems in the community were caused or exacerbated by drainage and sewage issues. Construction of the entire drainage system was laid out for the area with a total of 2,100 feet, finishing the system with covered drains, and instituting a community-run committee that oversees routine cleaning and maintenance of the drains.

Economic upliftment programmes with the help of another sister NGO are being developed to identify and implement opportunities for the community to bolster their socio-economic stability and reinforce their desire to continue to have a better quality of life. Families without shelter and requiring housing were identified by the community itself, which will be built in the next phase of the project, while other homes will have roof, kitchen and stove improvements made available to them.

Conclusion

The work done over the last three years has centred on building sustainable systems to support all kinds of built environment changes. Community involvement in these changes was the most important achievement for AKPBSP – as sustainable living quality interventions must be owned and maintained by the community. Communities went from not speaking to each other, to contributing double the amount expected from them for projects such as the installation of gas lines and the drainage system.

Today, the community has formed its own representative committee which liaises with government bodies and other stakeholders to resolve community issues. In September 2012, the committee lobbied and arranged for the visit of Minister Ali Nawaz Shah to the area. After touring the village, the Minister said that other villages should learn from this area's example, noting how clean it was and that he was happy to see that both boys and girls were receiving education beyond primary and secondary levels. He pledged Rs. 100,000 (US\$1,048) from his own pocket for the school, and committed Rs. 200,000 (US\$2,096) of Government funds for street pavements. By creating spaces and bringing the community together, AKPBSP was able to help the community articulate their own definition of what improving their quality of life would mean and look like. Once those needs were identified and prioritized, the community was enabled to work collectively with the help of AKPBSP to achieve their goals.

Healthy Processes Create Healthy Communities

Chawanad Luansang, Asian Coalition for Housing Rights, Thailand

This paper will share the experience of Asian Coalition for Community Action (ACCA) programme, a city-wide upgrading programme that Asian Coalition for Housing Rights (ACHR) carried out during 2009-2011. The ACCA programme promotes a people-driven process that will lead to a holistic approach in physical and social transformation of communities. Community building is essential to ground the healthy processes that will help create a self-organized community. Based on our experience in working with communities, when processes are driven by the people themselves – from surveying the problems to planning, designing and carrying out solutions together – this will lead to a joint action of community upgrading and development. The process of working together also builds and nurtures a healthy relationship among the people in the community that even after the ACCA project is finished, they develop other initiatives such as a welfare programme or a small community clinic to realise their needs with their own hands and manage the fund by themselves.



The key principles of the ACCA programme and a transformative process towards building a healthy community

The Asian Coalition for Community Action Programme (ACCA)

The ACCA Programme is a three-year programme set up by the Asian Coalition for Housing Rights (ACHR) in 2009 to catalyze and support citywide upgrading and partnerships between community organizations and local governments. By the end of 2010, initiatives had been supported in 107 cities across 15 nations. In each city, citywide and community surveys have been conducted, from which

settlement upgrading projects are identified. These are carried out by the residents, in partnership with local governments. Up to US\$3,000 is available for each small upgrading project and up to US\$40,000 for larger initiatives.

Small projects: By the end of 2010, 549 small upgrading projects had been approved in 102 cities in 15 countries and about half had been completed – for example, walkways, drains, toilets and water supply improvements. Each project allows the residents of these communities to collectively develop solutions to the immediate problems they face. The projects also lead to more active involvement by the communities and more collaboration with local governments. For instance, with US\$1,075 from ACCA, a 180-metre paved road was built linking a seafront slum in Khemara Phoumin (Cambodia) to the city. Managed by young women in the settlement's savings group, the grant was used to leverage another US\$50 from the community, US\$115 worth of materials from the local government, US\$138 from private donors and a strip of land for the road was donated by a shopkeeper in the community. In Ledok Gajah, a riverside settlement of 45 families in central Yogyakarta (Indonesia), with US\$500 from ACCA, a 135-metre paved road with side drains was built, linking all the houses; this was done after the residents mapped and surveyed their settlement, set up a women's savings group and established links with other riverside slums. The grant was topped up with US\$600 from community members, who did all the work themselves.

These small projects bring residents into a collective process where they determine their own needs and act on them. After deciding what they want to do and planning their project, most communities use the funds from ACCA to buy materials; costs are kept down as they contribute all the labour and add cash, food or additional materials to extend the budget.

Big projects: By the end of 2010, ACCA had supported 65 "big" housing projects with up to US\$ 40,000; these have helped 8,055 families to obtain secure land and housing. They also facilitated the creation of City Development Funds (CDFs), which are now operating as new financial mechanisms, linking communities and local governments in many cities. US\$ 2.3 million from ACCA leveraged US\$1.9 million from communities, US\$ 35.7 million from government (mostly land, also infrastructure, cash and materials) and US\$1.6 million from other sources. Among the ACCA-supported projects were the first community-driven housing projects in Lao PDR, Burma (Myanmar), Mongolia and Nepal, while city level revolving funds for housing were created to strengthen communities' negotiations to secure tenure in Surabaya, Leh, Quezon City and cities in Sri Lanka. Seventy CDFs are now at work, with 213,365 active savers, and with capital of around US\$ one million in Sri Lanka and Thailand, US\$ 0.5 million in Cambodia, US\$ 306,000 in the Philippines, US\$ 390,000 in Vietnam and US\$ 203,000 in Lao PDR.

The theory of insufficiency: ACCA sets very low budget ceilings and leaves it to implementing communities to work out how best to use the money and raise other funding. There is not enough development funding to finance "sufficiently" all that is needed to address the backlog in basic services, housing and tenure security. But ACCA funding allows communities to choose and then address one of their priorities. For most communities it is their first chance to manage money for their own development. It allows them to plan together, consider what resources they can bring and negotiate from others, and strategize how to stretch the money to do as much as possible. It also puts them in the citywide and people-driven process of poor communities coming together, working with the city, surveying and getting information about their settlements, starting savings, developing

plans and creating a city fund. Working within insufficiency is also important in creating the capacity to work at scale, as it makes external funding go much further.

ACCA funding supports communities to make physical improvements collectively. By comparison, microcredit for enterprises helps people individually, but it lacks a political or collective dimension: no power relations are challenged. When a community constructs a walkway, drain or other kind of public amenity that is meant to be provided by city government, the local authority notices. Even modest community initiatives are highly visible and show a new political agenda by groups that previously had been invisible. This may create tension initially, but that tension leads to dialogue.

ACCA funding: More than 70 per cent of funds go directly to the community organizations to support small upgrading and larger housing projects. Twenty per cent goes to capacity building (including the citywide surveys, workshops and exchanges).

Most funding for small ACCA projects are grants but many community networks choose to channel these grants as loans to communities (usually at a low interest or no interest), with repayments going to a revolving loan fund. This helps stretch scarce funds further. ACCA projects pull in new savers, make inactive savers active and expand savings processes to new areas. Funds may revolve within the community savings group (as in Indonesia), but in most it revolves within the network or the city level CDF (as in Vietnam, Lao PDR and the Philippines). In Cambodia, if the small project is for the residents' common good, the funds are a grant; if it is for individual families (such as individual toilets), it is a loan. The big ACCA projects are provided as loans, so repayments help to seed a new urban poor fund, or add power and lending capital to whatever community fund already exists.

Involving government: The citywide process of surveys, networking and projects is intended to get the attention of government. In 63 of the 66 big projects, there is some form of partnership with government, including joint city development committees of which poor community members are members. Out of 107 cities, 91 have some kind of committee that formalizes this city-community partnership. National level collaborative mechanisms are also operating in eight countries (Cambodia, Nepal, Vietnam, Sri Lanka, Mongolia, Fiji, Thailand and Lao PDR).

In 37 of the 65 cities with big ACCA projects, the government has provided land for housing (either free, on long-term nominal lease or on a rent-to-own basis), providing 7,381 poor squatter households with secure land tenure. Several communities with small ACCA projects in Cambodia, Indonesia, Nepal and Sri Lanka have also obtained secure land tenure from the government after implementing small upgrading projects in their communities. In several cities in Cambodia, Indonesia, Nepal, the Philippines, Vietnam, Sri Lanka, Fiji, Thailand and Lao PDR, local governments have provided some infrastructure (such as paved access roads, drains, sewers, electricity and water connections) in the big ACCA projects, and many have provided communities with technical help, building materials and the loan of heavy construction equipment. Perhaps the most direct way governments can contribute is by adding funds to support community initiatives and the city funds; this is happening with increasing frequency and scale. Local governments have contributed to 21 of the 70 city-based CDFs.

The citywide processes and the small and large projects also seek to change government policies so they allow people-driven slum upgrading to be sustained, scaled up and institutionalized. There are examples of important policy changes towards community-driven upgrading in cities and nations linked to ACCA support – for instance, in several cities in Cambodia, Nepal, the Philippines and Fiji and in Makassar (Indonesia).



The photos above show the process of planning the new settlement and biogas workshop for the poor community in Yangon city, Myanmar (2010)



These photos show the upgrading process in Nongduangtung community, Vientiane, Lao 2011

For more information please visit the ACHR website, www.achr.net

SOURCE: ACHR (2010), *107 Cities in Asia; Second Yearly Report of the Asian Coalition for Community Action Programme*, Asian Coalition for Housing Rights, Bangkok, 48 pages.

Building Trust in My/Our "Projects"

Khondaker Hasibul Kabir, BRAC University, Bangladesh

I cannot separate "myself" from "my" projects where "I" cannot be separated from "we". In the participatory approach, "I" becomes "we" respecting our individual identities. In every project we ask a question silently – how do we solve problems when we are part of a family? It appears that we have to understand "trust" in our projects to achieve a healthy community.

Participation and transparency are the keys for building trust. The approach is neither top-down nor bottom-up, it is both; where success depends on the level of building trust.

When I try to convince my colleagues, I cite from Somsook Boonyabancha, Founding Director, of the Asian Coalition for Housing Rights - "Trusting that people can do it". When I try to convince funding organizations I cite Stephen Covey, author of "The Speed of Trust", - "Our distrust is very expensive".

I am going to share two of our projects where the process evolved around trust. One is a low-income housing project in a cyclone-prone area and the other one is a community-led landscaping initiative in an urban slum.

Disaster resilient habitat after Cyclone AILA in Bangladesh (2009-2011)

'Disaster resilient habitat' began as a pilot project in a village in southern Bangladesh after the cyclone Aila in 2009. This area in Shatkhira District, one of the worst affected regions from this disaster, is a cluster village in a difficult and remote site. The houses, road networks and the only school in the village had been totally or severely damaged. The area was also facing damage from saline intrusion and erosion from the regular tidal effects causing breached embankments, which worsened the water and sanitation problems.

The project was funded by UNDP and implemented by BRAC (a Bangladeshi NGO, one of the largest development NGOs in the world). Technical support was provided by the Department of Architecture, BRAC University.

The project aimed to build new, stronger houses using the potential resources of the community and technical skills from professionals so that the inhabitants have a resilient habitat and would not need to move to cyclone shelters during a cyclone. Local labour, skills and materials were used as much as possible, with the technical knowledge provided by the university staff and students to enrich the construction knowledge base of the locals.

Continuous site visits, interaction and design workshops with the inhabitants, and SWOT analysis at the settlement and at the university were done to understand the inhabitants' needs, resources, skills and aspirations. This process helped to design a climate resilient house, which was adjusted gradually to a finer degree while working at the site bearing in mind the budget and climatic stresses. The methodology was based on a context specific process using the tools of participation and trust.

Before building any house, trust was built among the participants through continuous communication and information sharing. The design team stayed on site the whole time and worked hands on with the construction. The first demonstration house was built for the recipient chosen by

the inhabitants themselves. Afterwards, the remaining 42 houses were constructed en masse. The inhabitants were able to choose materials and space details based on the basic design principles. The use of materials that have high-embodied energy were reduced. The team used local materials and responded to local climate and site conditions to optimise the building's orientation, lighting and ventilation. The newly constructed school was a climate sensitive building and also served as a cyclone shelter. This also contained a killa (raised earthen mound) to shelter animals in emergency situations.

The inhabitants were aware of the solutions for water and sanitation problems, but they were reluctant to put them in practice. In this settlement, water and sanitation problems were solved through continuous focus group discussions, demonstrations and peer pressure.

The project also carried out training to local crafts people to improve their skills and to develop their capacity to carry on future initiatives and provided hands-on practical training to university students, as well as organised site visits for overseas students, to build their understanding of vulnerability to disasters and develop compatible solutions using limited resources.

The disaster resilient habitat is an integrated and comprehensive approach focusing on issues such as housing, livelihood, asset accumulation and capacity building. It is hoped that this type of approach will provide a secure and dignified living for the poor to avoid displacement and rehabilitation in the future.

To achieve a disaster-resilient community, we need a disaster-resilient attitude and education. During the implementation process, the project was able to establish a good relationship among the participants and shared their happy and unhappy stories. All stories are important for long-term sustainability. This is not a straightforward architecture project. The main challenge now is to take this process into the mainstream development strategy.

Platform of Hope: community-led landscaping in an urban slum in Bangladesh (2007 onwards)

Generally, some flowers are termed as "wild" and are stigmatized as weeds. They are not commonly used in designed landscapes of Bangladesh; they are perceived as unmanageable, not accepted and not good in a conventional way. In the Bangla language, these are called *"jongli"*, a derogatory term for the word "wild". Similarly, in a society, there are groups of poor people who do not have legal rights in Dhaka, the capital city of Bangladesh. They are not active in the mainstream and would rather stay in the shadow.

This is the case of a small homestead garden community in the biggest "slum" of Dhaka. Here the participants sow 'seeds', not only in the soil but also in the consciousness of the community to grow a 'garden'. It is evolving in a participatory process by trying to understand the dynamics of soil and plants; as well as understanding the related human aspects. The methodology is based on the spontaneous search for answers to how we act and solve problems when we are part of a family. In the process, we learned that nobody is a detached observer and the mere presence of anyone can make an impact.

During the initial phase of the garden project, appropriate plant-communities were selected taking into consideration the micro-conditions of the soil, sunlight and lake-water level. The participants planted locally available native species according to their preferred ecological niches. The garden

started with a narrow meandering path planted with climbing ornamental plants. It grew to contain a variety of locally native wild herbs and shrubs and a combination of leafy vegetables and perennial flowering plants, with an area full of climbing vegetables and a sunny space with seating surrounded by fruits, vegetables, flowers and lake-water. Water-loving plants were planted at the open drain that runs through the garden. Household waste is used as garden compost. The flora, fauna, paths, small spaces and the orientation of the garden towards the lake created interest among the neighbours especially the children. As the users "own" the space, it was their responsibility to maintain the land and care for the plants.

Improved Housing and Living Environment Lead to Improving Health

Kavneet Kaur, Development Alternatives, India

Various cross-sectional studies have established that poor housing and living environment lead to poor health. Many countries adopt strict building regulations to control exposure from identified health hazards, particularly related to carbon monoxide, lead, poor construction and poor sanitation. Many countries either do not have, or do not enforce, strict building regulations; as a result the adverse effects of specific habitat-related health hazards are pronounced, especially amongst vulnerable groups²⁴. In India, building regulations exist but these are not enforced strictly, especially in the case of low income settlements. With the primary concern being provision of shelter for the poor, the 'healthy living' environment aspect takes a back seat.

The quality of housing or the living environment has an impact on health. The key housing-related health risks include: waterborne diseases and vector diseases due to poor sanitary conditions, respiratory and cardiovascular diseases from indoor air pollution; illnesses and deaths from temperature extremes; the spread of communicable diseases due to poor sanitary conditions; and risks of home injuries.



Housing impacts health in many ways

The key components of housing and living environment which affect health are as follows:

Quality of Housing

<u>Clean drinking water and sanitation facilities</u>: Lack of access to drinking water and sanitation facilities at household level is a major cause of waterborne diseases. In 2003, 1.6 million deaths were estimated to be attributable to unsafe water and sanitation, including lack of hygiene; 90 per cent of this burden is concentrated on children under five, mostly in developing countries. So providing

²⁴ Raw G, Aizlewood CE, Hamilton RM. Building regulation health and safety. Watford, United Kingdom, Building Research Establishment and Department for the Environment, Transport and the Regions, 2001

access to drinking water and sanitation facilities at household level will play a crucial role in improving health.²⁵

<u>Indoor air quality</u>: Indoor air quality is an important component to consider in a house as it impacts the health of residents. The air quality in the house deteriorates when cooking and heating the homes using open fires, leaky stoves burning biomass (wood, animal dung and crop waste) or coal. Across the globe, nearly two million people die prematurely from illness attributable to indoor air pollution from household solid fuel use and 50 per cent of pneumonia deaths among children under five are due to particulate matter inhaled from indoor air pollutants.²⁶

<u>Thermal comfort</u>: Exposure to very high or very low indoor temperatures can be detrimental to health. Cold indoor conditions have been associated with poor health; including an increased risk of cardiovascular disease.²⁷ Large diurnal temperature changes have been associated with increased mortality, especially amongst vulnerable populations such as the elderly.²⁸

<u>Adequate living space and ventilation area</u>: Human beings need an optimum space around to perform daily activities. According to the UN Millennium Development Goals, a house is considered to provide a sufficient living area for the household members if not more than three people share the same habitable (minimum of four square meters) room.²⁹ Studies have shown that lack of living space also impacts children's psychological functioning. ³⁰ Furthermore, living privacy as well as adequate ventilation is necessary for both psychological and physical health.

<u>Construction Material</u>: Materials used for construction of houses can have a great effect on the residents' health. There are materials such as asbestos, toxic metals and radon which have irreversible health effects. For example, asbestos which is used for roofing sheets, ceiling tiles, light weight insulation and lagging can cause asbestosis, lung cancer, malignant tumours and allergies.³¹ Many resin-bonded materials produce fumes and leach into the environment.

<u>Tenure</u>: House ownership helps owners to achieve better physical and mental health outcomes than renters.³² Researchers have put forth a variety of possible explanations for this phenomenon, suggesting that homeowners experience higher levels of self-esteem and encourage investments in house improvements which may be related to improved health, and that homeowners are more likely to live in higher-quality housing and have more freedom to adapt their surroundings to their needs, reducing stress and leading to greater levels of satisfaction.³³

²⁵ <u>http://www.who.int/water_sanitation_health/wsh0404summary/en/</u>

²⁶ http://www.who.int/mediacentre/factsheets/fs292/en/index.html

 ²⁷ Krieger J and Higgins DL. "Housing and Health: Time Again for Public Health Action." Am J Public Health, 92(5): 758-68, 2002

²⁸ Shaw M. "Housing and Public Health." *Annu Rev Public Health*, 25: 397-418, 2004.

²⁹ http://unstats.un.org/unsd/mdg/Metadata.aspx?IndicatorId=0&SeriesId=711

³⁰ http://www.ajol.info/index.php/asp/article/viewFile/54601/43109

³¹ http://www.unhabitat.org/downloads/docs/6516_38614_hs459.pdf

³² Connolly, Sheelah, Dermot O'Reilly, and Michael Rosato. 2010. House Value as an Indicator of Cumulative Wealth is Strongly Related to Morbidity and Mortality Risk in Older People: A Census-Based Cross- Sectional and Longitudinal Study. *International Journal of Epidemiology* 39: 383-391.

³³ Cairney, John and Michael H. Boyle. 2004. Home Ownership, Mortgages and Psychological Distress. Housing Studies 19(2): 161-174; Elsinga, Marja and Joris Hoekstra. 2005. Homeownership and Housing Satisfaction. Journal of Housing and the Built Environment 20: 401-424; Macintyre, Sally, Anne Ellaway, Geoff Der, Graeme Ford, and Kate Hunt. 1998. Do Housing Tenure and Car Access Predict Health Because They Are Simply Markers of Income or Self Esteem? A Scottish Study. Journal of Epidemiological Community Health 52: 657-664; National Association of Realtors Research Division.

Outdoor Living Environment

<u>Drainage and Sewerage System</u>: Inadequate drainage and sewerage systems can create a massive problem as stagnant pools can became breeding sites for disease vectors. Wastewater from households contains pathogens that can pollute groundwater sources, increasing the risk of diseases such as lymphatic filariasis. Poor drainage can lead to flooding, resulting in property loss, and people may even be forced to move to escape floodwaters. Flooding may also damage water supply infrastructure and contaminates domestic water sources³⁴ and enter into the food chain, for example via fruits, vegetables or fish and shellfish.

<u>Waste Management</u>: Incorrect disposal of solid and liquid wastes lead to unsanitary conditions which result in diseases, infections, even epidemics. Open dumpsters and uncontrolled garbage become breeding grounds for insects, pests, snakes and rats that can infect children who play near these areas or carry them into houses they frequent. Skin diseases, eye problems, diarrhoea, typhoid, scabies, cholera, intestinal parasites are only some of the health risks that are created by unsanitary disposal of waste.³⁵

<u>Crowding</u>: Residential crowding has been linked with physical illness, including infectious diseases such as tuberculosis, respiratory infections and with psychological distress among both adults and children. Children who live in crowded housing may have poorer cognitive and psychomotor development or may be more anxious, socially withdrawn, stressed or aggressive.

<u>Proximity to Hazardous Sites</u>: Living near hazardous sites with industrial and radioactive pollutants can have a great impact on the health of the inhabitants such as cancer, birth defects and genetic mutations. Hazardous sites contain various harmful chemicals which get transmitted through different routes (air, ground water or soil) to houses and their inhabitants.

Development Alternatives' initiative in enhancing the housing and living environment of the poor

Development Alternatives Group has been working on various components of housing and living environment with positive impacts on the health of the low income communities. The interventions are described in the diagram below:

^{2006.} Social Benefits of Homeownership and Stable Housing. Washington, DC: Author; Rossi, Peter H. and Eleanor Weber. 1996. The Social Benefits of Homeownership: Empirical Evidence from National Surveys. *Housing Policy Debate* 7(1): 1-35.

³⁴ <u>http://www.who.int/water_sanitation_health/hygiene/settings/hvchap5.pdf</u>

³⁵ http://www.ehow.com/info_8547168_effects-unsanitary-waste-disposal.html#ixzz29ku9IApT



Intervention of Development Alternatives in Housing and Living Environment

However, not much has been done in order to measure the health impact of the work done in the housing and living environment.

We would like to share the experience of our initiative towards provision of safe drinking water in slums of Delhi through point-of-use water treatment method – Solar Water Disinfection (SODIS). It is an eco-friendly and economic method of water treatment which is quite apt for developing countries. SODIS is a point-of-use method for treatment of drinking water to be followed at household level. With an aim to promote its usage, a pilot project was initiated in association with two field partner NGOs in 10,000 households of 15 slums in south-west and east Delhi. The project aimed at promoting an inexpensive way of providing safe drinking water at the point of use. Its primary goal is an improved health situation, i.e. reduction of waterborne diseases and child mortality through provision of safe drinking water and improved hygiene practices in the target communities.

Awareness raising of the SODIS method was conducted in the slums for two years (2009-2011). Awareness in the community was raised through door-to-door communication by community

mobilisers, distribution of IEC material, street plays and radio shows. The team also demonstrated water quality testing during the course of these interactions which raised the curiosity of the communities as they came to know their water quality.

A baseline study in similar adjoining slums was conducted and the study shows that many people succumbed to diseases such water-borne as diarrhoea and gastrointestinal disorders due consumption to of contaminated and untreated water. Around 36 per cent of the respondents were ill for three to five days, followed by 20 per cent for a period of less than 3 days in the last six months.



Raising awareness in slums



People adopting SODIS method in slums of Delhi

A health impact study was conducted among the slum dwellers to find out the impact of SODIS upon the health of its regular users. In this study, 1,008 households located in 13 slums of east and southwest Delhi were surveyed and interviewed.

The study results showed that 36 per cent of the total surveyed households have experienced a positive change in their health status after using SODIS and 29 per cent of the children in the households experienced a reduced incidence of diarrhoea. Among the positive health impacts, reduced stomach ache is the most prominent one which is observed in 44 per cent of the total households. Other positive health impacts include

reduction in gastrointestinal disorders, reduced diarrhoea among adults, reduced cases of vomiting and an improvement in the general health status. These results have been found to be directly related to the duration of practicing SODIS by the households. There is a difference of 32 per cent and 23 per cent respectively for positive health change and reduced diarrhoea between the households that have been practicing SODIS for less than 3 months and more than one year. This shows that regular use of safe drinking water has a positive impact on the health of its users.

The field observations and interactions with health professionals have indicated that personal and household hygiene plays a significant role in reducing the incidence and spread of infectious diseases. In fact, lack of household hygiene is one of the major causes for faecal-oral diarrhoea among children. Thus, it was concluded that while SODIS has positively affected the health of a number of household users, there is further need to encourage its long-term usage coupled with increased awareness regarding hygienic practices to obtain more significant results.