

Introduction



Housing
for Health



Nepal Village
Sanitation
Programme



Peer Exchange
and Analysis



About the World
Habitat Awards
and BSHF



About
Healthabitat
and CHDS



Housing for Health, Australia

WINNER, WORLD HABITAT AWARD

This resource introduces the award-winning work of the Housing for Health programme and highlights how the good practice within this project has been transferred outside Australia to other contexts.

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Introduction

Housing
for HealthNepal Village
Sanitation
ProgrammePeer Exchange
and AnalysisAbout the World
Habitat Awards
and BSHFAbout
Healthabitat
and CHDSA word from
HealthabitatA word from the
Building and Social
Housing Foundation

A word from Healthabitat

Paul Pholeros, Director of Healthabitat

Healthabitat is an Australian based company, established in 1984, that aims to improve the health of poor people by improving their living environment. Healthabitat has designed and managed 200 Housing for Health projects throughout Australia since 1999 and also undertaken applied research to improve many important parts of the living environment. Housing for Health projects target the improvement of houses and household living conditions in urban, rural and remote indigenous communities. From 1999 to 2013, Housing for Health projects improved over 7,800 houses and the health of over 50,000 people.

The health principles developed from the Australian work have been used in urban housing in the USA and in Nepal. The Nepal Village Sanitation Programme was the host of the BSHF study visit in 2012. The programme was developed in partnership with Community Health and Development Society (CHDS) Nepal, village development committees and the Rotary Club of Dee Why Warringah, Australia. It aims to provide village families in Nepal with the ability to dispose of human waste safely by:

- the construction and installation of toilets to collect and remove waste
- using septic or biogas systems, as appropriate, to treat and dispose of waste - the biogas is also a free source of smokeless cooking fuel
- providing local rainwater storage for dip flushing and hand-washing
- using and developing local expertise, labour and materials in every stage of the project
- providing education on sanitation and hygiene
- ensuring the ongoing assessment and maintenance of the waste systems is completed by local community staff

By 2013 the Nepal Village Sanitation Programme had completed over 100 toilets that benefit over 1,000 people in 3 villages. The work also included the upgrading of 5 toilets and waste water system for a school of 400 children.

The World Habitat Award has meant the work of Healthabitat has been exposed to a wider international audience. Since winning the award, many groups, organisations and governments in widely varying environments such as Alaska, Greenland, the UK, South Africa, Papua New Guinea and Bangladesh, have seen the direct relevance of the Healthy Living Practices in improving health and the living environment.



Introduction

Housing
for HealthNepal Village
Sanitation
ProgrammePeer Exchange
and AnalysisAbout the World
Habitat Awards
and BSHFAbout
Healthabitat
and CHDS

A word from Healthabitat

A word from the Building and Social Housing Foundation

A word from the Building and Social Housing Foundation

Silvia Yafai, Head of International Programmes, BSHF

The World Habitat Award for innovative and sustainable housing solutions was presented to Healthabitat's Housing for Health programme at the United Nations global celebration of World Habitat Day in Aguascalientes, Mexico, on Monday 3rd October 2011.

This inspiring programme in Australia, established in 1999 by Healthabitat to improve the health of indigenous people in Australia, ensures that they have access to safe and well functioning housing and an improved living environment. The nine Healthy Living Practices pioneered through the project are now part of current federal and state government policy. Knowledge gained through the Housing for Health projects has been used to develop a national indigenous housing design code that respects cultural traditions and norms.

The evaluation committee, including members of the World Habitat Awards Advisory Group as well as the international judges at the United Nations Human Settlements Programme (UN-Habitat) and the United Nations University, were enthusiastic in the endorsement of Housing for Health as a worthy winner of the World Habitat Award, recognising its significant achievements in terms of improving living conditions and the environment as well as its potential to inspire others working in the fields of housing and health.

Aspects of the programme that can be highlighted in particular include the development of the Healthy Living Practices to describe the functioning hardware needed in a house to allow access to healthy living, the policy of immediate repair work that improves houses from the first day of a project which builds community trust, and the direct involvement of the local indigenous communities in all aspects of the project. Its capacity to influence national indigenous housing and health policy through the use of research and detailed project data is another key strength of the programme, reinforcing the links between health, housing function and the broader living environment.

Further details of the Housing for Health programme can be found in this report, as well as the application of its health principles in the Nepal Village Sanitation Programme, and links to a range of additional reports and resources.



Introduction



Housing
for Health



Nepal Village
Sanitation
Programme



Peer Exchange
and Analysis



About the World
Habitat Awards
and BSHF



About
Healthabitat
and CHDS



About the programme

- Context
- The history of
Housing for Health
- Healthy Living
Practices
- Actors involved
- Housing for Health
methodology
- Funding
- Impact of Housing
for Health
Programme

Analysis and lessons learned

Transfer of the Housing for Health approach

Image gallery

About the programme

Housing for Health (HfH) is a programme initiated in 1985 by Healthabitat to improve the housing and health of indigenous people in Australia, by ensuring they have access to safe and well functioning housing and an improved living environment.

It is based on safety and health principles called Healthy Living Practices (HLPs) that link housing and the living environment directly to health outcomes and have an order of priority. The programme uses a methodology to ensure people have the ability to achieve the Healthy Living Practices. It uses a 'survey and fix' methodology for testing whether the houses are safe to live in and have functioning electrical and water supply systems. The Healthy Living Practices pioneered through the project are now part of current federal and state government policy and the knowledge gained through the Housing for Health projects has been used to develop a national indigenous housing design code that respects cultural traditions and norms.



Introduction

Housing
for HealthNepal Village
Sanitation
ProgrammePeer Exchange
and AnalysisAbout the World
Habitat Awards
and BSHFAbout
Healthabitat
and CHDS

About the programme

- Context

- The history of Housing for Health
- Healthy Living Practices
- Actors involved
- Housing for Health methodology
- Funding
- Impact of Housing for Health Programme

Analysis and lessons learned

Transfer of the Housing for Health approach

Image gallery



Context

There is a long history of abuse, mistreatment and misunderstanding of the indigenous people of Australia, not least when it comes to the provision of appropriate housing. Indigenous people live in very poor housing conditions and in cases where the state provides housing, it is not designed with any understanding of the way of life or cultural needs of these communities, who are the most socially disadvantaged population in Australia. Indigenous housing is a sector in crisis, with a very high proportion of substandard housing, overcrowding, resource and capacity constraints, remoteness from mainstream services and systems of governance. In this environment, basic housing asset management systems in indigenous communities are unevenly applied across the country and in many instances are absent.

Consequently the incidence of substandard 'health hardware'¹ in dwellings is very high, with serious health consequences. Many indigenous people have low literacy rates as well as a pattern of poor health characterised by high rates of infectious disease and very high rates of diabetes, vascular disease and obesity. Skin infections, respiratory diseases, rheumatic fever, rheumatic heart disease and ear disease in children also occur at much higher rates than in the non-indigenous population. Life is typically lived in harsh and remote conditions. Housing is usually provided by local or state governments or indigenous community organisations and is of poor quality with little, if any, maintenance or good management.

¹Health hardware is a term originally used by Dr Fred Hollows to describe the physical equipment needed to give people access to the health giving services of housing. The equipment must have design and installation characteristics that allow it to function and to maintain or improve health status. For example, to wash a young child, the "health hardware" needed may include a water supply, pumps, tanks, pipes, valves, taps, hot water system, tub and drainage pipes.



Introduction

Housing
for HealthNepal Village
Sanitation
ProgrammePeer Exchange
and AnalysisAbout the World
Habitat Awards
and BSHFAbout
Healthabitat
and CHDS

About the programme

- Context
- **The history of
Housing for Health**
- Healthy Living
Practices
- Actors involved
- Housing for Health
methodology
- Funding
- Impact of Housing
for Health
Programme

Analysis and lessons learned

Transfer of the Housing for Health approach

Image gallery



The history of Housing for Health

The three directors of Healthabitat first met in 1985 in the Anangu Pitjatjantjara Lands, north west South Australia when they were invited by Yami Lester, at the time Director of the Aboriginal controlled health service, Nganampa Health Council, to work on a project that would 'stop people getting sick' or, in the local language, 'Uwankara Palyanku Kanyintjaku' (UPK). Yami Lester saw that despite the Aboriginal control of the health service in the region and the improved treatment of illness, health had not improved. He proposed that both medical services and a healthy living environment were required to achieve health gain.

The project produced what became known as the UPK model, which was regarded nationally as a yardstick for environmental intervention in indigenous communities between 1987 and 1990. Through this initial project, the core safety and nine Healthy Living Practices that now form the foundation of the Housing for Health approach were developed. In 1990, the team proposed a one-year research project that involved working in one of the smaller Pitjatjantjara communities (12 houses) that was part of the UPK review work, for one year to assess the extent of the impacts of UPK and the contributing factors to achieving ideal house function rates and health gains. With the main proportion of the AUD\$40,000 grant being used for maintenance works to keep houses functioning and with strong local involvement, the project managed to maintain the 12 houses throughout the year.

The results of the research were overwhelmingly positive and were recorded and published in great detail in *Housing for Health: Towards a better living environment for Aboriginal Australia* by Healthabitat in 1994. The Housing for Health book was launched in Parliament House by the then Federal Health Minister and Human Rights and Equal Opportunities head, Michael Dodson. The work then received the Royal Australian Institute of Architects Presidents Award. It has since sold over 5,000 copies, many overseas, and provides the most concise statement of Healthabitat's aims and methods of how to improve health by improving the immediate living environment.

It was the need to publish that brought about the name and the formal Healthabitat partnership. The publication of the Housing for Health book confirmed the future direction of Healthabitat and a philosophy that no profit should be made from people living in poor conditions.

Between 1987 and 1994, small projects were completed in central Australia and the methodology was further improved. From 1994 to 1999, pilot projects were completed in other states around Australia. These projects proved that the method was successful in a variety of environmental and social conditions and led to further projects being developed nationally. At the end of the 1990s, the Housing for Health programme became a national programme and is currently being implemented around Australia. From 1999 to 2010, a combination of both Housing for Health and Federal Government-supported 'Repairing Houses for Better Health' projects (identical in method to Housing for Health projects), have improved over 7,000 houses in 180 project locations around Australia.



Introduction

Housing
for HealthNepal Village
Sanitation
ProgrammePeer Exchange
and AnalysisAbout the World
Habitat Awards
and BSHFAbout
Healthabitat
and CHDS

About the programme

- Context
- The history of
Housing for Health
- **Healthy Living
Practices**
- Actors involved
- Housing for Health
methodology
- Funding
- Impact of Housing
for Health
Programme

Analysis and lessons learned

Transfer of the Housing for Health approach

Image gallery



Healthy Living Practices

At the heart of the Housing for Health method are the Healthy Living Practices (HLPs). These link the safety and health of people to the functions of key parts of the house and surrounding living environment.

Housing for Health projects are prioritised by overarching safety issues and the nine Healthy Living Practices to maximise the health benefit of any resources used for improvement. The Critical or most important Healthy Living Practices (shown in italics below) have the highest priority. Projects aim first to improve the Critical Healthy Living Practices (CHLPs), then the remaining Healthy Living Practices.

Safety

Electrical, Gas, Fire and Structural safety

The nine Healthy Living Practices

- 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 impacts of over-crowding
- 6 Reducing the negative effects of animals, insects and vermin
- 7 Reducing the health impacts of dust
- 8 Controlling the temperature of the living environment
- 9 Reducing hazards that cause minor injury (trauma)

The following section gives a description of each of the Healthy Living Practices and their links to safety and health.



Introduction

Housing
for HealthNepal Village
Sanitation
ProgrammePeer Exchange
and AnalysisAbout the World
Habitat Awards
and BSHFAbout
Healthabitat
and CHDS

About the programme

- Context
- The history of
Housing for Health
- **Healthy Living
Practices**
- Actors involved
- Housing for Health
methodology
- Funding
- Impact of Housing
for Health
Programme

Analysis and lessons learned

Transfer of the Housing for Health approach

Image gallery



Safety

When designing, upgrading or maintaining a house, immediate, life-threatening dangers are given the highest priority. Housing for Health considers the following safety issues:

- Electrocution
- Gas explosion and asphyxiation
- Injury from fire
- Structural collapse

Healthy Living Practice 1 - Washing People

Being able to use functioning washing facilities reduces the spread of diseases, including diarrhoeal disease, respiratory disease, hepatitis and infections. The rates of these diseases in some Australian indigenous communities are as high as in many developing countries and are many times higher than for non-indigenous children. Diarrhoeal and respiratory diseases, in particular, are the major causes of illness amongst indigenous children and also play a major role in the malnutrition experienced in the first five years of life.

Healthy Living Practice 2 - Washing clothes and bedding

Regular washing of clothes and bedding can help reduce the incidence of infectious diseases, such as diarrhoeal disease, respiratory infections, scabies and other skin infections.



Introduction

Housing
for HealthNepal Village
Sanitation
ProgrammePeer Exchange
and AnalysisAbout the World
Habitat Awards
and BSHFAbout
Healthabitat
and CHDS

About the programme

- Context
- The history of
Housing for Health
- **Healthy Living
Practices**
- Actors involved
- Housing for Health
methodology
- Funding
- Impact of Housing
for Health
Programme

Analysis and lessons learned

Transfer of the Housing for Health approach

Image gallery



Healthy Living Practice 3 - Removing waste water safely

Waste water leaks and overflows around the living environment can make people sick. Disease-causing bacteria can be transmitted if people or animals come into direct contact with waste water or if the drinking water supply is contaminated with waste water. So removing waste water safely from living areas, and managing it safely around the community, is critical to keeping people healthy.

Healthy Living Practice 4 - Improving nutrition, the ability to store, prepare and cook food

Poor nutrition is one factor contributing to indigenous people having high rates of obesity, diabetes, cardiovascular disease and renal disease. Poor nutrition is also a major cause of infectious diseases in children. In remote communities, choosing a healthy diet is complicated by factors such as low incomes, the cost of food, local store management practices and the ability to store, prepare and cook food at home.

Healthy Living Practice 5 - Reducing the negative impacts of over-crowding

Crowded living conditions increase the risk of the spread of infectious diseases, such as meningococcal disease, rheumatic fever, tuberculosis and respiratory infections. In a crowded house it can also be more difficult to access health hardware, such as a working shower, toilet, hot water and washing machines.



Introduction

Housing
for HealthNepal Village
Sanitation
ProgrammePeer Exchange
and AnalysisAbout the World
Habitat Awards
and BSHFAbout
Healthabitat
and CHDS

About the programme

- Context
- The history of
Housing for Health
- **Healthy Living
Practices**
- Actors involved
- Housing for Health
methodology
- Funding
- Impact of Housing
for Health
Programme

Analysis and lessons learned

Transfer of the Housing for Health approach

Image gallery

Healthy Living Practice 6 - Reducing the negative effects of animals, insects and vermin

People's health is badly affected by contact with animals, vermin and insects in the living environment.

Examples include:

- Mosquito borne illnesses
- Chronic gut parasite carried by dogs
- Dustmites causing increased levels of asthma
- Flies carrying trachoma bacteria that impacts on eye health
- Mice and rats attacking electrical cables and water pipes

Healthy Living Practice 7- Reducing the health impacts of dust

Many small communities, particularly in rural and remote areas, experience problems with dust, caused by either unsealed roads or vacant land in the community or from dust that is blown into the community from surrounding arid, rural or drought affected lands.

Dust causes direct health problems through the irritation of mucosal surfaces and the skin, which contributes to eye diseases, such as trachoma, respiratory disease and skin infections.



Introduction

Housing
for HealthNepal Village
Sanitation
ProgrammePeer Exchange
and AnalysisAbout the World
Habitat Awards
and BSHFAbout
Healthabitat
and CHDS

About the programme

- Context
- The history of
Housing for Health
- **Healthy Living
Practices**
- Actors involved
- Housing for Health
methodology
- Funding
- Impact of Housing
for Health
Programme

Analysis and lessons learned

Transfer of the Housing for Health approach

Image gallery

Healthy Living Practice 8 - Controlling the temperature of the living environment

Living in houses that are too cold or too hot can contribute to a range of physical illnesses, as well as emotional distress. The young and elderly are most at risk from temperature extremes. Dehydration is a major risk factor for young children.

Healthy Living Practice 9 - Reducing hazards that cause trauma

If houses are poorly designed and constructed, or not well maintained, there is an increased risk that residents may be injured. Elderly people, people with disabilities and young children are particularly at risk. Injuries may require medical treatment or hospitalisation and could result in infections or even disability.



Introduction

Housing
for HealthNepal Village
Sanitation
ProgrammePeer Exchange
and AnalysisAbout the World
Habitat Awards
and BSHFAbout
Healthabitat
and CHDS

About the programme

- Context
- The history of
Housing for Health
- Healthy Living
Practices
- **Actors involved**
- Housing for Health
methodology
- Funding
- Impact of Housing
for Health
Programme

Analysis and lessons learned

Transfer of the Housing for Health approach

Image gallery

Actors involved

Over 75 per cent of all project staff are local indigenous people who are engaged in all aspects of the work such as project planning, training of new staff, testing and fixing houses, assisting licensed trades in major fix work, data entry and office work, and liaison with householders in their own language about the aims and methods of the programme.

Other organisations that have been involved in the project are:

- Industry groups such as Master Builders Association, Australian Institute of Architects, stove manufacturers and lighting manufacturers, which have all contributed to the research and development projects
- Federal and state governments, which have supported Housing for Health projects since 1994
- Individual communities

Groups benefitting from the Housing for Health programme include:

- The families who live in the houses with improved function
- The indigenous communities involved in the work, benefitting from improved housing and employment opportunities
- Local health staff who have to spend less time treating infectious diseases and can focus on other areas of work
- Housing managers who can use Housing for Health data for free and access skills of the local community trained staff
- Housing policy makers, researchers and health planners who have better evidence on which to base policy decisions



Introduction

Housing
for HealthNepal Village
Sanitation
ProgrammePeer Exchange
and AnalysisAbout the World
Habitat Awards
and BSHFAbout
Healthabitat
and CHDS

About the programme

- Context
- The history of
Housing for Health
- Healthy Living
Practices
- Actors involved
- **Housing for Health
methodology**
- Funding
- Impact of Housing
for Health
Programme

Analysis and lessons learned

Transfer of the Housing for Health approach

Image gallery



Housing for Health methodology

Healthabitat works with local indigenous communities to repair existing homes and train local people in basic repair and maintenance skills. It has two main areas of work – the Housing for Health projects and associated applied Research and Development (R&D) projects.

Nominations for inclusion in the programme come from the communities themselves, as well as indigenous housing boards and Indigenous Affairs departments. After a feasibility study and if the communities wish to participate, a 'Survey-Fix' week is set aside and a number of local community members are trained to work alongside technical staff to inspect, test and record about 240 items in the houses, and where possible, make repairs. The information on each house is entered onto a database and work lists are given to qualified trades people who carry out urgent repairs a day later. Other repairs are completed over the following months and a second Survey-Fix session is carried out to review the work.

Survey groups are trained in a short time to test houses and record the results, using a carefully prescribed methodology. While they are in a house, they will also mend minor faults (such as a dripping tap, a missing stove control knob or basin plug, etc.) driven by the **'no survey without service'** philosophy, the Dr Fred Hollows principle that insisted on improvements during and not after the work. The tools, materials and skilled people are available on the first day of any project to commence urgent fix work on houses as identified by the survey/testing method. Rather than receiving a report on housing faults, the residents see an immediate improvement in the function of their houses and this builds trust allowing more complex and time consuming work to continue. All fix work is prioritised according to the nine Healthy Living Practices, with life threatening safety having overarching priority. The survey groups will then make a report for the skilled tradesmen who make an immediate start on sorting out those things that the groups are not entitled to fix. The effort required to achieve this engagement is rarely understood by government agencies and bureaucrats although successful and appropriate means of working have been developed over the years.

Healthabitat has also initiated a broad range of applied, practical research projects to improve housing, covering issues such as development of tap ware, hot water systems, waste disposal systems, lighting, kitchen design, prefabricated transportable shower laundry and toilet modules, local indigenous staff training aids and customised database and information systems.



Introduction

Housing
for HealthNepal Village
Sanitation
ProgrammePeer Exchange
and AnalysisAbout the World
Habitat Awards
and BSHFAbout
Healthabitat
and CHDS

About the programme

- Context
- The history of
Housing for Health
- Healthy Living
Practices
- Actors involved
- Housing for Health
methodology
- **Funding**
- Impact of Housing
for Health
Programme

Analysis and lessons learned

Transfer of the Housing for Health approach

Image gallery



Funding

Since 1998, the Housing for Health programme has had the following sources of funding: state governments (75 per cent), NGOs (10 per cent), private sector (5 per cent) and indigenous community funding and in kind contributions (10 per cent).

The running costs of the Healthabitat organisation have historically always been very low. From 1991 to 1998, the running costs were met by the three partners when no other funds were available. Funding of all contract staff is on a project-by-project basis and a small percentage of each project's funds is used for running costs.

A key feature of projects is the percentage of funds spent on house repair and not on management, overheads or planning costs. From 1999 to 2009, projects had an average cost of US\$7,500 per house for all works including repair work, management, staff wages, building materials and transport, which makes Housing for Health a low-cost programme by Australian standards.

Since 2006, approximately 15 per cent of the national Housing for Health budget has been allocated to R&D projects.



Introduction



Housing
for Health



Nepal Village
Sanitation
Programme



Peer Exchange
and Analysis



About the World
Habitat Awards
and BSHF



About
Healthabitat
and CHDS



About the programme

- Context
- The history of
Housing for Health
- Healthy Living
Practices
- Actors involved
- Housing for Health
methodology
- Funding
- **Impact of Housing
for Health
Programme**

Analysis and lessons learned

Transfer of the Housing for Health approach

Image gallery

Impact of Housing for Health Programme

- Over 180 projects have improved more than 7,000 houses with poor function since 1999 and improved the living conditions of over 40,000 indigenous people. This represents one third of the nation's indigenous housing stock.
- Over 75 per cent of the Housing for Health's staff team is comprised of local indigenous people and are paid in line with local rates to carry out productive work on their own community houses. Skills gained include project planning, training, electrical and plumbing skills, data entry and office work and liaison with householders, which can be used to gain employment in the mainstream employment sectors.
- Small businesses are created within the community, dealing with minor plumbing maintenance, water meter reading for local authorities, window insect screen replacement teams, lunch making and catering, landscaping and fencing.
- When all elements of a house are fully functioning, there is greater access to decent housing.
- Reduced running costs for lighting and cooling improve affordability of housing.



Introduction

Housing
for HealthNepal Village
Sanitation
ProgrammePeer Exchange
and AnalysisAbout the World
Habitat Awards
and BSHFAbout
Healthabitat
and CHDS

About the programme

Analysis and lessons learned

- Key achievements and lessons learned

- Challenges faced
- Critical success factors
- Pre-conditions for transfer

Transfer of the Housing for Health approach

Image gallery

Key achievements and lessons learned

The key achievements of the Housing for Health programme include:

- A recent state government health department review of ten years of Housing for Health work showed a 40 per cent reduction in hospital admissions for environmental health related illnesses.
- The use of data generated by Housing for Health projects over the years informs the National Indigenous Housing Guide – now nationally accepted as an essential design guide for the construction and refurbishment of indigenous housing.
- The current National Partnership Agreement for Remote Indigenous Housing being delivered nationally across Australia has incorporated the nine Healthy Living Practices. Ongoing work is being carried out to ensure that implementation of the policy is delivered. Whilst indigenous community housing organisations are happy to take on the ideas, there is a greater struggle to ensure that state landlords do so (with some notable exceptions).
- Housing for Health project data is regularly updated and made available by Healthabitat to the Australian Institute of Health and Welfare (a Federal Government agency) who package and place the data online for use by registered housing and health researchers.

Some of the lessons Healthabitat has learned from the Housing for Health programme are:

- Change is possible and will most typically be achieved by making a small change first, with larger changes to follow
- Making some change to people's living conditions on the first day of every project is important
- Set clear goals and principles, with a clear priority for action that can be understood by the local community
- Retaining a strong consistent methodology is important for programme longevity
- Defining and recording hard data helps to show progress to those we work with and the local community as a whole
- A broad range of technical skills is essential to improve all aspects of housing
- Engage local people who will benefit from the project in all aspects from the outset



Introduction

Housing
for HealthNepal Village
Sanitation
ProgrammePeer Exchange
and AnalysisAbout the World
Habitat Awards
and BSHFAbout
Healthabitat
and CHDS

About the programme

Analysis and lessons learned

- Key achievements and lessons learned
- **Challenges faced**
- Critical success factors
- Pre-conditions for transfer

Transfer of the Housing for Health approach

Image gallery

Challenges faced

The commonly held myths about indigenous people – e.g. that the indigenous people ‘trash’ the good homes provided for them and do not deserve decent housing provision – often prevent change in housing policy and practice. Healthabitat has used the evidence collected from the Housing for Health projects to disprove some of the common myths.

The hard evidence of Housing for Health data has highlighted the failures of previous government interventions and this has created political disfavour and slowed the work in some states. The programme remains committed to its priorities and methods of working and accepts that it is better to do this than compromise. By sticking to the principles, political acrimony during the initial stages has been incurred and slower growth achieved than might have been possible. Fast, politically expedient growth threatens long-term programme sustainability as rapid expansion denies the very factors that have led to success – community involvement through staff training and careful project planning.



Introduction

Housing
for HealthNepal Village
Sanitation
ProgrammePeer Exchange
and AnalysisAbout the World
Habitat Awards
and BSHFAbout
Healthabitat
and CHDS

About the programme

Analysis and lessons learned

- Key achievements and lessons learned
- Challenges faced
- **Critical success factors**
- Pre-conditions for transfer

Transfer of the Housing for Health approach

Image gallery

Critical success factors

Housing for Health projects and the programme as a whole have been regularly monitored and evaluated over 25 years, both internally and externally. The continuing emphasis on internal monitoring and evaluation is one of the reasons for the continued programme development and improvement, reinforcing the links between health, housing function and the broader living environment. The most comprehensive external evaluations include an independent review of the programme, (2002 - 2005) and an independent review on the health impacts of 10 years of Housing for Health projects in New South Wales, (1998 - 2009).

Other critical success factors of the programme are:

- Developing the Housing for Health methodology with standard repeatable tests to assess the safety and health function of housing.
- Policy of immediate repair work that improves houses from the first day of a project, which builds community trust.
- As monitoring health gain on each project can be costly and disruptive, projects use the detailed housing function data collected before repair work commences and similar data after all repair work has been completed.
- Community involvement in all aspects of projects such as on the tools, repair work, data work, management of the project, community liaison and training. This has meant significantly better project results, better targeting of resources and the possibility of locally controlled ongoing housing maintenance and management.
- Using detailed project data, assembled into a national database, to influence national indigenous housing and health policy.
- Encouraging more holistic thinking between government departments so that housing and health are linked.



Introduction

Housing
for HealthNepal Village
Sanitation
ProgrammePeer Exchange
and AnalysisAbout the World
Habitat Awards
and BSHFAbout
Healthabitat
and CHDS

About the programme

Analysis and lessons learned

- Key achievements and lessons learned
- Challenges faced
- Critical success factors
- **Pre-conditions for transfer**

Transfer of the Housing for Health approach

Image gallery

Pre-conditions for transfer

Healthabitat will, wherever possible, allow the full resources of the Housing for Health methodology to be used without commercial cost, provided the following conditions are upheld:

- Acceptance that all work on housing or the living environment (and associated budgets) be prioritised according to overarching safety issues and the nine Healthy Living Practices.
- At least 75 per cent of all programme staff employed will be 'local community' people (that is those who are the recipients of the programmes resources) and they will participate in all aspects of the work.
- A pro-forma feasibility report will be completed before any project is approved.
- Each project will require a 'non-commercial' project licence be agreed with Healthabitat to ensure the integrity of the project and the Housing for Health programme. This licence will insist on local employment, immediate fix work with licenced trades on site from commencement of the project.
- Any data derived from the programme will be shared with Healthabitat.
- The methodology cannot be sold-on or be used to make profit for any other parties.



Introduction



Housing
for Health



Nepal Village
Sanitation
Programme



Peer Exchange
and Analysis



About the World
Habitat Awards
and BSHF



About
Healthabitat
and CHDS



About the
programme

Analysis and
lessons learned

Transfer of the
Housing for Health
approach

Image gallery

Transfer of the Housing for Health approach

Nepal

A community sanitation project has been ongoing since 2007 in Nepal. Whilst not a full Housing for Health project, this project used several of the Housing for Health principles to improve living conditions and health. See the **Nepal Village Sanitation Programme** section for more information.

USA

A trial Housing for Health project in Brooklyn public housing, New York City, USA was completed in 2010 and, at the time of writing in 2013, is awaiting approval to proceed with a full Housing for Health project in the same area. Ten apartments were chosen to see if the Housing for Health method could be applied to this urban environment. The trial project was organised by Common Ground and the Brownsville Partnership. Local community staff volunteered and were trained to complete the Survey Fix work and employed for a week. Local trades were employed to do some fix work on each apartment. Much like the work in Australia, the survey fix results showed lack of routine maintenance and little, if any, damage or vandalism.



Introduction



Housing
for Health



Nepal Village
Sanitation
Programme



Peer Exchange
and Analysis



About the World
Habitat Awards
and BSHF



About
Healthabitat
and CHDS



About the
programme

Analysis and
lessons learned

Transfer of the
Housing for Health
approach

Image gallery

Image gallery



Prefab shower toilet unit in transit



A Housing for Health team



Housing for Health team members and friend



Fixing a kitchen



Introduction



Housing
for Health



Nepal Village
Sanitation
Programme



Peer Exchange
and Analysis



About the World
Habitat Awards
and BSHF



About
Healthabitat
and CHDS



About the
programme

Analysis and
lessons learned

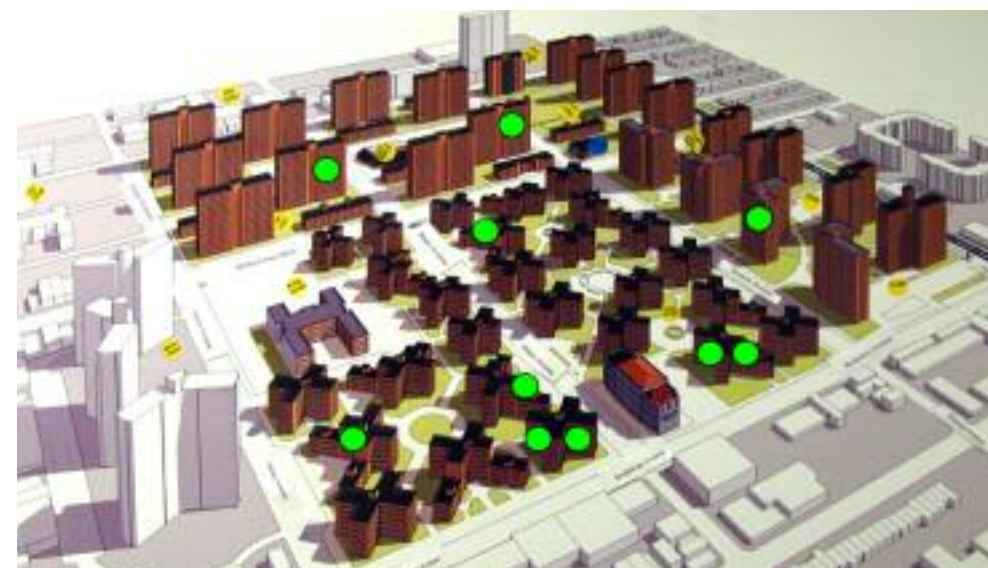
Transfer of the
Housing for Health
approach

Image gallery

Image gallery



A 'Survey-Fix' team of the pilot project in New York City, USA



Housing for Health pilot project in New York City, USA



Toilet and waste system construction in Nepal



Housing for Health team planning the 'Survey-Fix' day



Introduction



Housing
for Health



Nepal Village
Sanitation
Programme



Peer Exchange
and Analysis



About the World
Habitat Awards
and BSHF



About
Healthabitat
and CHDS



About the
programme

Analysis and
lessons learned

Transfer of the
Housing for Health
approach

Image gallery

Image gallery



Fixing a wastewater blockage



A local team member tries a new toolbelt



Introduction

Housing
for HealthNepal Village
Sanitation
ProgrammePeer Exchange
and AnalysisAbout the World
Habitat Awards
and BSHFAbout
Healthabitat
and CHDS

About the programme

- Village life in Nepal
- History of the programme
- Features
- Staging each project
- Funding

Image gallery

About the programme

The Nepal Village Sanitation Programme looks at investing for the long term in hardware², people and their health.

The Community Health Development Society Nepal (CHDS) and Healthabitat Australia have worked in partnership since 2007 designing and delivering the programme, with the ongoing assistance and support of the Village Development Support Committees and Rotary Club of Dee Why Warringah. The work in Nepal has been funded jointly by Healthabitat, Rotary Australia and individual donors, most of whom are from Australia.

The programme aims to provide village families in Nepal with the ability to dispose of human waste safely by:

- Construction and installation of toilets to collect and remove waste
- Using septic or biogas systems, as appropriate, to treat and dispose of waste
- Providing local rainwater storage for dip flushing and hand-washing
- Using local expertise, labour and materials in every stage of the project
- Providing education on sanitation and hygiene
- Ensuring the ongoing assessment and maintenance of the waste systems.

²Health hardware is a term originally used by Dr Fred Hollows to describe the physical equipment necessary for healthy, hygienic living. The equipment must have design and installation characteristics that allow it to function and to maintain or improve health status. In a water supply system, for example, health hardware includes both the bore and the basin plug, as well as the shower rose, taps and drain.



Introduction

Housing
for HealthNepal Village
Sanitation
ProgrammePeer Exchange
and AnalysisAbout the World
Habitat Awards
and BSHFAbout
Healthabitat
and CHDS

About the programme

- **Village life in Nepal**
- History of the programme
- Features
- Staging each project
- Funding

Image gallery

Village life in Nepal

"The country is rich but the people are poor".

- An observation about Nepal by highly respected Nepalese surgeon, Dr. Ram Shrestha

And so it is for the people of the villages perched on the steep hillsides of Kavre district in the upper Kathmandu valley with spectacular uninterrupted views of the majestic Himalayas.

The villages, with populations of around 400 – 1000 people, are of the Tamang ethnic group, practising Buddhism in a principally Hindu country. Whilst they are not far from a major administrative centre, they are marginalised, as an "indigenous" ethnic group, and are often overlooked by local development programs. Their daily lives are taken up with farming for a largely subsistence existence. Women do much of the hard farm labour. Some of the younger men join the swelling ranks of workforce sent to countries such as Qatar, Dubai, and Iraq where they are used as cheap labour, but they somehow manage to send small amounts of money home to their families.

Village children attend local schools and the children's education is strongly supported by the local communities, so that future generations can move beyond the high levels of illiteracy of their parents and have a chance to create better opportunities for themselves. The lifestyle is communal with recognised family connections and responsibilities. Houses do not have the luxury of bathrooms or taps; water is often accessed at communal tap points and water shortages are common. Villagers are forced to go to the fields to use a "toilet": a hole in the ground with plastic sheeting providing makeshift shelter and limited privacy. Old people and young children often can't make it to the fields.

Cooking is mostly done indoors on open and smoky fires in unventilated rooms. The diet is largely rice and vegetable based, with occasional supplementation of meat usually at festival times, or when families raise some money.



Introduction

Housing
for HealthNepal Village
Sanitation
ProgrammePeer Exchange
and AnalysisAbout the World
Habitat Awards
and BSHFAbout
Healthabitat
and CHDS

About the programme

- Village life in Nepal
- **History of the programme**
- Features
- Staging each project
- Funding

Image gallery

History of the programme

• November 2006

Community Health Development Society Nepal (CHDS) and Rotary are invited to Bhattedande village, Kavre District, to discuss issues affecting the daily lives of the villagers. Water supply, lack of toilets, education, and income generation are identified as key priorities.

The Sree Tamang Village Environment Development Committee (STVEDC) is formed in Bhattedande, to work with CHDS, Rotary and Healthabitat to develop a toilet sanitation project.

• April 2007

Healthabitat works with the villagers to plan the first stage of the sanitation project. Discussions centre on the use of biogas as well as septic waste treatment systems, water supply, quality and usage, design of the toilet buildings including rainwater collection and how the partners will work together.

The villagers access water at 10 tap points located throughout the village and gather water from these 10 taps twice a day when water is released from a header tank. They fill buckets and metal vessels and carry them back to their homes.

The local plumber and construction coordinator work with Healthabitat to set up water quality testing. Water quality testing commences and the local villagers are trained to complete the testing regularly over 12 months. Water metres are also installed to measure average daily use from three of the 10 tap points located throughout the village. Plumbing repairs and modifications were commenced on the first day of the project. Since then, a reticulated water supply has been put into Bhattedande village.

The project partners agree to start Stage 1 of the toilet building project by constructing only two toilets, one with a biogas and one with a septic waste disposal system. The project is managed by CHDS and uses local labour and materials. This "trial" allows all partners to gauge their ability to effectively work together and the villagers have a chance to observe the process of construction, view the results, assess their appropriateness and apply any modifications if necessary for the continuation of the project.



Introduction

Housing
for HealthNepal Village
Sanitation
ProgrammePeer Exchange
and AnalysisAbout the World
Habitat Awards
and BSHFAbout
Healthabitat
and CHDS

About the programme

- Village life in Nepal
- **History of the programme**
- Features
- Staging each project
- Funding

Image gallery

History of the programme

• July 2007

The project achieves accreditation with the Rotary Australia World Community Services. Feedback from the villagers has been positive regarding the two trial toilets and the project begins in earnest.

• July 2007 - November 2010

A total of 58 toilets with either septic tank (38) or biogas (20) waste systems are built in Bhattedande. Villagers are trained in toilet maintenance and regular hygiene including hand washing with soap. Two local young women are trained to inspect and report any faults with the toilets as part of the ongoing maintenance.

• April 2011

The project moves into two more Tamang (ethnic group) villages: Arubot and Dandegaun. A skilled team is developed from the Bhattedande project and this team, in coordination with the management of the CHDS team, leads the project in the next two villages. Each village develops a local management committee, whose members are encouraged to participate in the activities of the project and some of whom have gained employment in the project.

The same methodology applies, that is, two trial toilets are built first in each village. Once approved and with any design modifications completed, the project is rolled out in two stages each year, one before and one after the monsoon time. The target for these two villages combined is 100 toilets.

• 2012 onwards

Works are ongoing in the three villages of Kavre district: Bhattedande, Arubot and Dandegaun.



Introduction

Housing
for HealthNepal Village
Sanitation
ProgrammePeer Exchange
and AnalysisAbout the World
Habitat Awards
and BSHFAbout
Healthabitat
and CHDS

About the programme

- Village life in Nepal
- History of the programme
- **Features**
 - **The toilet building**
 - Rainwater storage
 - The septic tank system: Human waste to crops
 - The biogas system: Human and buffalo waste to cooking gas
- Staging each project
- Funding

Image gallery



The toilet building

The toilet buildings are all external to the houses. Design considerations included easy access, privacy, security, rainwater collection, available land and ease of maintenance.

The toilet building design was developed in consultation with village families and CHDS. Healthabitat developed drawings to communicate the design and the construction process used building techniques and materials that are regularly available and familiar to the Nepali team, including the biogas technology.

Features of the toilet include:

- locally made and sourced building materials, fixings, fittings and products
- secure roof fixing: in villages, roofs are often held down by the weight of rocks as they are cheap and available. The toilet building design uses screws for more effective fixing of the roof and less likelihood of polluting the rainwater collected off the roof
- generous roof overhangs to keep the entry dry during the wet season and maximise rainwater collection
- an Asian style pan with dip flush toilet: dip flushing is a manual flushing technique using water from the internal tap provided to flush away the human waste
- the toilet pan is installed level with the concrete slab surface to make cleaning easier
- a locally sourced polyethylene rainwater tank which stores 500 litres of water. This tank supplements the often inadequate village water supply, provides water for dip flushing the toilet pan, cleaning the floor and for hand washing using the external tap
- locally-sourced timber roof framing in-filled with mosquito mesh above the brick walls and door frame to provide light, cross-flow ventilation and protection from insects, whilst maintaining privacy and cooling the space
- an external lock on the door to keep the toilet secure and enable it to be well-maintained by the owners
- locally-made stone pavers laid on the ground to prevent mud being carried into the toilet by the user, particularly in the wet season
- a clothes hook to enable the toilet to be used for changing clothes and hanging towels
- a brush for cleaning the toilet.



Introduction

Housing
for HealthNepal Village
Sanitation
ProgrammePeer Exchange
and AnalysisAbout the World
Habitat Awards
and BSHFAbout
Healthabitat
and CHDS

About the programme

- Village life in Nepal
- History of the programme
- **Features**
 - The toilet building
 - **Rainwater storage**
 - The septic tank system: Human waste to crops
 - The biogas system: Human and buffalo waste to cooking gas
- Staging each project
- Funding

Image gallery

Rainwater storage

Even though some villages might have a reticulated water supply, water is at a premium. Metered water supply attracts potentially increasing monthly usage costs and those householders with no access to a reticulated supply have to cart water for long distances from communal well points. The toilet building design therefore included a rainwater tank to collect water run-off from the roof. The water from the tank on the toilet building was originally intended for dip flushing, hand washing and cleaning the inside of the toilet building. Residents now consider the tank as their household supply where clean water is stored for other household and personal use. Since the project started, residents with a toilet building have commented on the lower incidence of gut infections and diarrhoea in the children because they now have the ability to wash their hands regularly.

CHDS and the village committees run formal hygiene and hand washing sessions with villagers, particularly with families. Regular monitoring and inspections by trained local teams provide ongoing enforcement of correct usage of the toilets and appropriate hygiene practices.



Introduction

Housing
for HealthNepal Village
Sanitation
ProgrammePeer Exchange
and AnalysisAbout the World
Habitat Awards
and BSHFAbout
Healthabitat
and CHDS

About the programme

- Village life in Nepal
- History of the programme
- **Features**
 - The toilet building
 - Rainwater storage
 - **The septic tank system: Human waste to crops**
 - The biogas system: Human and buffalo waste to cooking gas
- Staging each project
- Funding

Image gallery

The septic tank system: Human waste to crops

The septic tank system is used when families have small areas of land and no large animals, such as a buffalo. The nutrient rich effluent produced through a septic tank treatment system is used on the fields to enhance the crops and also provides some financial relief from having to buy expensive fertilisers.

The septic tank system is constructed on site from concrete and brick and the internal surface is hard rendered.

The septic tank works by:

- collecting human waste through the toilet pan that is dip flushed using less than one litre of water
- the waste passes into the first chamber of the septic tank where solid waste is treated by natural bacteria
- the treated liquid passes through to the second chamber where further settlement and treatment of any remaining solids occurs
- finally, nutrient-rich effluent is piped underground from the second chamber to the surrounding crops and is a valuable fertiliser.

Approximately every 10 years the accumulated sludge from the first chamber needs to be removed, which also provides additional valuable fertiliser.



Introduction

Housing
for HealthNepal Village
Sanitation
ProgrammePeer Exchange
and AnalysisAbout the World
Habitat Awards
and BSHFAbout
Healthabitat
and CHDS

About the programme

- Village life in Nepal
- History of the programme
- **Features**
 - The toilet building
 - Rainwater storage
 - The septic tank system: Human waste to crops
 - **The biogas system: Human and buffalo waste to cooking gas**
- Staging each project
- Funding

Image gallery

The biogas system: Human and buffalo waste to cooking gas

The families receiving a biogas system must have land near their house that is large enough for all the components of the system and they must also have a large animal, such as a buffalo to generate enough waste for the biogas system to function effectively.

The key element in this system is the generation of methane gas through the breakdown of the waste, which is then used for cooking inside the house. Traditional cooking methods on smoky indoor fires, combined with poor ventilation, causes ongoing respiratory and eye infections. Replacing wood fires with gas in indoor kitchens is a healthy and cheap alternative.

Cutting trees for firewood destabilises the steep terraced hillsides characteristic of Nepal's valleys. Landslides are an ever-present threat particularly in the wet season. Tree roots are also useful to help filter and improve groundwater.

The biogas process works by:

- collecting buffalo waste, which is mixed with a small volume of water
- combining this with human toilet waste in the biogas digester
- producing methane gas from waste breakdown
- collecting the gas in the biogas digester dome
- extracting the gas from the top of the dome-shaped digester using the gas pressure
- connecting pipes from the digester directly to the house to provide gas to a single burner in the kitchen
- finally, the solid waste exits the digester to be used as a high value fertilizer on crops.



Introduction

Housing
for HealthNepal Village
Sanitation
ProgrammePeer Exchange
and AnalysisAbout the World
Habitat Awards
and BSHFAbout
Healthabitat
and CHDS

About the programme

- Village life in Nepal
- History of the programme
- Features
- **Staging each project**
- Funding

Image gallery

Staging each project

Important to the success of the Nepal Village Sanitation Programme has been the structure and management of each project.

Every project starts small, building only two toilets, to give local people the chance to see the toilet, waste systems and the full building process. It also tests the village's financial, in-kind and organisational contribution to the project. Each project then builds 10-15 toilets per stage and completes two stages a year, building before and after the monsoon rains occurring in mid-year, when site conditions preclude building works.

The capacity of the local teams determines the number of toilets that can be built per stage. Each stage involves the following planning and management by CHDS:

- liaison with the village committee
- family selection
- septic tank or biogas system selection
- project budget preparation
- budget approval
- family contracts completed
- collection of the cash contribution from each family
- site planning
- engineer approval of the works

The construction work involves the following:

- purchase of materials
- transport of materials to each building site
- construction works
- payment of all staff and materials suppliers
- quality control



Introduction

Housing
for HealthNepal Village
Sanitation
ProgrammePeer Exchange
and AnalysisAbout the World
Habitat Awards
and BSHFAbout
Healthabitat
and CHDS

About the programme

- Village life in Nepal
- History of the programme
- Features
- **Staging each project**
- Funding

Image gallery

Staging each project

At the end of every stage, the village hosts a 'key handover ceremony' where committee members, local families, CHDS representatives and individual donors occasionally travelling to Nepal participate in the official handing over of the keys to the newly finished toilets to the household beneficiaries.

Some of the lessons learned and benefits of the staging are:

- Residents understanding the benefits of biogas in a working kitchen after the two trial toilets were built, which in turn alleviated the possible concerns about poor smell and hygiene
- Avoiding construction during the wet season
- Continuing improvement in construction and management standards through careful inspection of completed works at every stage
- Overcoming local misunderstandings about how a septic system functions - that is, the tank is not a big "bucket" that requires emptying when full, but that the constant outflow of treated effluent is a necessary part of the ongoing process of waste breakdown in the septic system.

Most importantly, villagers realise the project team are delivering on the initial "promise" of improving sanitation. The villagers have spent many years living with broken promises of improved sanitation.



Introduction

Housing
for HealthNepal Village
Sanitation
ProgrammePeer Exchange
and AnalysisAbout the World
Habitat Awards
and BSHFAbout
Healthabitat
and CHDS

About the programme

- Village life in Nepal
- History of the programme
- Features
- Staging each project
- **Funding**

Image gallery

Funding

The work in Nepal has been funded jointly by Healthabitat, Rotary Australia and individual donors, most of whom are from Australia. Donors are matched with recipient families and each donor receives a report at the completion of each stage with a photograph of the family and the official key handover. All donated monies go directly to the program with any on costs for supplementary program management, design development and promotion paid for by Healthabitat.

The toilet and wastewater treatment system built under the Village Sanitation Project costs approximately AUD\$1,600 (as of 2013), with the price varying slightly due to the type of waste treatment system and local inflation.

In Nepal, Healthabitat and partner CHDS are constantly finding examples of sanitation solutions that favour the very low initial capital cost “cheap” toilet. The key feature of the Nepal Village Sanitation Programme aims at investing in the long term health of communities by removing waste safely. To achieve this, the project emphasises:

- building local partnerships and employing local people in all aspects of the work and in each village project
- increasing knowledge and practices regarding sanitary hygiene and safe waste removal
- providing waste removal systems and toilet buildings that have an anticipated lifespan of a minimum of 25 years
- the use of local materials and skills
- training and employment for previously unskilled people
- high quality technical solutions that are regularly assessed and improved
- quality assurance and evaluation
- budget setting and control for each stage of a project
- a family contribution both in cash and in kind
- the ongoing maintenance of the toilet systems



Introduction



Housing
for Health



Nepal Village
Sanitation
Programme



Peer Exchange
and Analysis



About the World
Habitat Awards
and BSHF



About
Healthabitat
and CHDS



About the
programme

Image gallery

Image gallery



Bhattedande village



Toilet with biogas system in Bhattedande



Pipe attached to the roof collecting water run-off for storage



Vegetables fertilised by the effluent produced through a septic tank treatment system



Introduction



Housing
for Health



Nepal Village
Sanitation
Programme



Peer Exchange
and Analysis



About the World
Habitat Awards
and BSHF



About
Healthabitat
and CHDS



About the
programme

Image gallery

Image gallery



Gas from the biogas system used for cooking purposes



Cooking stove and pipes connected to the biogas system



Handover of key to the newly finished toilet to a beneficiary



A resident doing her washing using water stored in the rainwater tank



Introduction



Housing
for Health



Nepal Village
Sanitation
Programme



Peer Exchange
and Analysis



About the World
Habitat Awards
and BSHF



About
Healthabitat
and CHDS



About the peer exchanges

Study visit to Nepal Village Sanitation Programme

London roundtable discussion on health and housing

About the peer exchanges

Healthabitat's Housing for Health Programme was awarded the World Habitat Award in 2011, recognising its potential to inspire other housing practitioners to improve the living environment in their context. In this respect, peer exchange activities were organised by BSHF in London and in Nepal to share the experiences and facilitate the transfer of the Housing for Health programme to other contexts.

A roundtable discussion (see London roundtable section), held on 21st August 2012 in London, brought together a wide range of people working in the housing, health and environmental health fields in the UK to introduce the work of Healthabitat in Australia and discuss the issues on health and housing faced today in the UK.

In addition, a one-week study visit to the Village Sanitation Project in Nepal was also held to demonstrate how the Housing for Health principles have been applied on a community scale in a different country and context to address sanitation problems and improve the living environment of the residents.



[Introduction](#)[Housing
for Health](#)[Nepal Village
Sanitation
Programme](#)[Peer Exchange
and Analysis](#)[About the World
Habitat Awards
and BSHF](#)[About
Healthabitat
and CHDS](#)[About the peer
exchanges](#)[Study visit to Nepal
Village Sanitation
Programme](#)[London roundtable
discussion on health
and housing](#)

Study visit to Nepal Village Sanitation Programme

Healthabitat and Community Health Development Society Nepal (CHDS) were enthusiastic about hosting the BSHF study visit to Nepal in October 2012. It provided a rare opportunity for them as hosts to show the detailed work needed to achieve programme success as well as to learn from the invited practitioners whose comments and suggestions were used to improve the Village Sanitation Project. The international study visit took place from 30th October – 2nd November 2012, bringing together 11 practitioners from nine different countries working in the field of housing and health. Participants included architects, academics, researchers and health professionals, as well as representatives of non-governmental and non-for-profit organisations.

The international study visit provided participants with an opportunity to exchange knowledge and experience, become part of a community of practice and gain an in-depth understanding of the key aspects of the Nepal Village Sanitation Project. Broader issues related to sanitation and health and housing were discussed based on participants' experiences. The international study visit allowed participants to understand the principles of Healthabitat's Housing for Health programme in Australia and how the approach is applied in the Village Sanitation Project in Nepal hence, providing participants with methodologies, tools and ideas to adapt and adopt in the context of their own work.

The four days of the international study visit were divided between participants' presentations of their own work, an introduction to the Housing for Health programme and the transfer of its approach in the Nepal Village Sanitation Project, as well as field visits to the villages. During the field visits, the participants took part in the handover of the completed toilets and biogas systems to the household beneficiaries of three villages in Kavre District: Arubot, Dandegaun and Bhattedande.



Introduction



Housing
for Health



Nepal Village
Sanitation
Programme



Peer Exchange
and Analysis



About the World
Habitat Awards
and BSHF



About
Healthabitat
and CHDS



About the peer exchanges

Study visit to Nepal Village Sanitation Programme

- Study visit schedule

- International peer exchange participants
- Participants' perspectives
- Image gallery

London roundtable discussion on health and housing

Study visit schedule

DAY 1

- Arrival of all participants and travel to Dhulikhel
- Introduction and discussion about the peer exchange programme

DAY 2

- Presentation of the work and projects of the CHDS Nepal Team and discussion about the Village Sanitation Project
- Presentation of the participants' work and sharing of experiences
- Presentation of the structure and work of Healthabitat

DAY 3

- Field visits to village sanitation projects in Arubot and Dandegaun villages
 - Visit to the Kali Devi local school to see the connection between programmes on teeth and toilet and participate in the handover of restored toilets and tooth brushing facilities
 - Participate in the handover of 10 toilets in the two villages to household beneficiaries
 - Meeting with the construction teams
- Presentation on making the link between the Village Sanitation Project in Nepal and Healthabitat's work in Australia and the USA

DAY 4

- Field visit to Bhattedande village and tour of completed toilets
- Meeting with the Bhattedande village development committee
- Presentation of Healthabitat on the linkages between health and the living environment
- Feedback session and discussion: learning from Nepal Village Sanitation Project and Healthabitat's Housing for Health principles



CHINA

BHATTEDANDE
DANDAGAUN
ARUBOT

NEPAL



Introduction



Housing
for Health



Nepal Village
Sanitation
Programme



Peer Exchange
and Analysis



About the World
Habitat Awards
and BSHF



About
Healthabitat
and CHDS



About the peer
exchanges

**Study visit to Nepal
Village Sanitation
Programme**

- Study visit schedule
- International peer
exchange participants
- Participants'
perspectives
- **Image gallery**

**London roundtable
discussion on health
and housing**

Image gallery



Presentations of the participants' work



Sandra Meihuber, public health dentist from Australia and CHDS giving sets of toothpaste and toothbrush to Kali Devi school



An integrated waste system: toilet, rainwater storage, septic tank, biogas digester



A newly built biogas digester



Introduction



Housing
for Health



Nepal Village
Sanitation
Programme



Peer Exchange
and Analysis



About the World
Habitat Awards
and BSHF



About
Healthabitat
and CHDS



About the peer
exchanges

**Study visit to Nepal
Village Sanitation
Programme**

- Study visit schedule
- International peer
exchange participants
- Participants'
perspectives
- **Image gallery**

**London roundtable
discussion on health
and housing**

Image gallery



A household showing their cooking stove, which uses gas produced by the biogas digester



A renovated and improved toilet in Kali Devi school



A new toilet being handed over to a family in Dandegaun village



A vegetable garden fertilised by the nutrient rich effluent produced through a septic tank treatment system



Introduction



Housing
for Health



Nepal Village
Sanitation
Programme



Peer Exchange
and Analysis



About the World
Habitat Awards
and BSHF



About
Healthabitat
and CHDS



About the peer exchanges

Study visit to Nepal Village Sanitation Programme

- Study visit schedule
- International peer
exchange participants
- Participants'
perspectives
- **Image gallery**

London roundtable discussion on health and housing

Image gallery



Bishnu of CHDS Nepal explaining how the waste system works



International study visit participants doing the group exercise on identifying linkages between health and housing toothpaste and toothbrush to Kali Devi school



Participants visiting Bhattedande village



Group photo of the international study visit participants and hosts together with the Bhattedande village leaders and members



Introduction

Housing
for HealthNepal Village
Sanitation
ProgrammePeer Exchange
and AnalysisAbout the World
Habitat Awards
and BSHFAbout
Healthabitat
and CHDSAbout the peer
exchangesStudy visit to Nepal
Village Sanitation
ProgrammeLondon roundtable
discussion on health
and housing- Roundtable
participants**London roundtable discussion on health and housing**

Prior to the international study visit to Nepal, BSHF organised a roundtable discussion on health and housing on 21st August 2012 in London to support the transfer of Healthabitat's Housing for Health approach. The roundtable discussion was led by Paul Pholeros who introduced the Housing for Health programme and its nine Healthy Living Practices to an audience of invited experts and practitioners within the housing, health and public health sectors in the UK.

Paul Pholeros is one of the three directors of Healthabitat and is also a principal architect of a practice based in Sydney working on urban, rural and remote area architectural projects throughout Australia and overseas. His pioneering work has been recognised by the Australian government for his services to health and housing issues in the Indigenous community. An overview of health and housing issues in the UK was also given by guest speaker, Viv Mason, Principal Consultant of Building Research Establishment (BRE), followed by a presentation of The Liverpool Healthy Homes Programme, presented by Ian Watson of Liverpool City Council.

The roundtable included discussions on the key principles of the Housing for Health approach that may inform the work of participants in their local context as well as providing an opportunity for the participants to share their local own experiences. Through group exercises and exchange, participants discussed how the link between health and housing can be more firmly established in both government and popular understanding in the UK.



Introduction

Housing
for HealthNepal Village
Sanitation
ProgrammePeer Exchange
and AnalysisAbout the World
Habitat Awards
and BSHFAbout
Healthabitat
and CHDS

About the World Habitat Awards

The World Habitat Awards is an annual international competition that recognises innovative and sustainable solutions to key housing challenges in the global South as well as the North.

The Awards were established in 1985 by the Building and Social Housing Foundation as part of its contribution to the United Nations International Year of Shelter for the Homeless.

Every year an award of £10,000 is presented to each of the two winners at a United Nations event. In addition to the prize and international recognition, peer exchange activities are carried out with each of the winners to promote the international transfer of the approach.

Further information about the Awards, including related study visit or peer exchange activities and assessment procedures can be found by visiting www.worldhabitatawards.org.



About BSHF

The Building and Social Housing Foundation (BSHF) is an independent research organisation that promotes sustainable development and innovation in housing through collaborative research and knowledge transfer.

Established in 1976, BSHF works both in the UK and internationally to identify innovative housing solutions and to foster the exchange of information and good practice.

BSHF believes that everyone should have access to decent housing and is committed to promoting housing policy and practice that is people centred and environmentally responsible.

Further information on the research, publications and other activities of the Building and Social Housing Foundation are available at www.bshf.org.



Introduction

Housing
for HealthNepal Village
Sanitation
ProgrammePeer Exchange
and AnalysisAbout the World
Habitat Awards
and BSHFAbout
Healthabitat
and CHDS

About Healthabitat and CHDS

Healthabitat Australia and Community Health Development Society Nepal (CHDS) have worked in partnership since 2007 designing and delivering the Nepal Village Sanitation Programme, with the ongoing assistance and support of the Village Development Support Committees and Rotary Club of Dee Why Warringah.

Healthabitat

In 1998, Healthabitat became a private Australian company managed by three Directors:

- Paul Pholeros AM (Architect), Managing Director
- Dr. Paul Torzillo AM (Thoracic Physician), Medical Director
- Stephan Rainow (Public and Environmental Health Officer), Community Director

Healthabitat commenced as a not-for-profit partnership, not as a consultancy group, with each partner contributing their professional skills to various projects as needed. Any income not used on the projects was used to defray travel and running costs.

The Directors made a not-for-profit charter which allows the private company to trade as a Pty Ltd company, receive fees and government contracts and act as a social business. This structure also allows Healthabitat to use any profits to develop the Housing for Health methodology and tools, provide seed funds for national research projects and support overseas projects. Directors receive cost reimbursement. All Healthabitat staff members are paid and many of them informally donate additional time and resources to achieve better project results.

Twice yearly, in February and August, Healthabitat holds national Managers' meetings where all state and national management staff members attend a two day workshop to receive formal skills and programme information updates from Healthabitat, share their Housing for Health research and development project field experiences through formal presentations and receive briefings from invited guests.

For further information on the work of Healthabitat, please visit www.healthabitat.com



Introduction



Housing
for Health



Nepal Village
Sanitation
Programme



Peer Exchange
and Analysis



About the World
Habitat Awards
and BSHF



About
Healthabitat
and CHDS



Community Health and Development Society, Nepal

CHDS Nepal is a registered non-government, and not-for-profit organisation. It aims to improve health and strengthen economic development opportunities for marginalised, indigenous people of many different communities within Nepal.

CHDS strives to improve health by conducting dental health camps and building toilets with efficient waste treatment and hand washing to help prevent infectious diseases. CHDS works with donor agencies, government agencies and local village committees to improve health.

