2006: Volume 13 Number 2

Habitat for Humanity®

The Forum

promoting dialogue among Habitat for Humanity's worldwide partners

Environmental Impact on Housing and Construction Innovations

Developing holistic building plans

by Larry English and Kate Bistline

Before starting to construct a house, we know the house must be designed. We depend on the expertise of architects and engineers to ensure that the completed house will meet the standards. Yet our mission calls us to do more than build houses. How do we design "more than houses"?

First, we must have a shared idea of what it is that we are trying to build. According to the mission statement,

KIM MACDONALD

Former President of the United States, Jimmy Carter, and thousands of volunteers from around the world have supported the community building work of Habitat for Humanity at the Jimmy Carter Work Project for more than 20 years. The building event has energized communities at locations around the globe.

we want "decent houses in decent communities in which every person can experience God's love and can live and grow into all God intends."

Today the term "community" is often ascribed to people living in a spatial or political entity, such as a suburb, city or county. Community, as such, has no bearing on relationships between people, shared culture, history or future. However, God designed community so that families would benefit from each other materially, socially and spiritually. Because of sin, and its tendency toward self-preservation, God desired that such people would live in relationship with Him, so that no man would rule over another.

To develop a decent community, we must work from the holistic concept of "human habitat," i.e., a total living environment — physical, social, spiritual and economic — for sustaining and enhancing human life.

Just as the design of a Habitat house in Mozambique differs from the design of a Habitat house in Romania, the design of a Habitat community will also be different. The program that we implement to achieve the decent houses in the decent communities will need to be uniquely designed for the context. Program design depends on an understanding of the context.

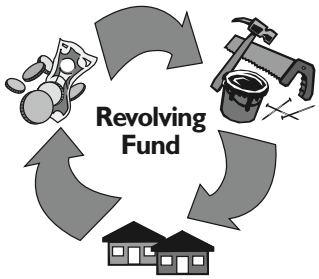
Continued on page 2

contents

Developing holistic building plans
Continued from page 1

Physical context: "Habitat"
Habitat is a builder. It is the physical infrastructure and environment that will provide opportunity for parents to raise their children in a safe, secure and nurturing social environment, and in stable and robust shelter that will provide protection from the elements, and physical and material security. In addition, such habitat should consider proximity to opportunities for employment and/or income generation, and be supported by public amenities and services which should include physical and social infrastructure, recreational amenities, and public transportation. While HFH is primarily focused on shelter, the sustainability of the communities established through its initiatives is dependent on the provision or existence of the holistic physical environment.

Economic and financial context
Habitat is a lender. The financial sustainability of a housing program funded by HFH — i.e., the revolving "Fund for Humanity" — is very much dependent on the income sustainability of its mortgagees. Income stability is, in turn, dependent on the local or national — perhaps even the global — economy. What is important is that we recognize that the target group selected has associated risks, and that these are identified and very carefully considered prior to investment, and that the project and financial system are designed to mitigate these risks.



Social and institutional context
Habitat is a transformer. The needs of the poor extend beyond housing and most often are a higher priority than shelter. Developing a decent community requires collaboration between many players, as noted above. Accordingly, the institution which designs, implements and manages should include such parties. The primary stakeholders — the homepartners — are included at inception, and are capacitated to gradually assume responsibility for the environment, as HFH and other implementing partners transition out.

Legal context
The procedures for developing land and the risks of lending money require HFH to understand the legal framework of the country, both in terms of planning statutes and other development legislation, property law, contractual laws, etc. Understanding the extra-legal environment — i.e., the unwritten rules that operate in poor communities — is most important as it is more difficult, even dangerous, to enforce contracts in areas where the laws are not respected or commonly upheld.

To build decent communities, we must start with a plan. The design of living environments is important because they serve to shelter, nurture and enhance the quality of human life. They enable or disable social, spiritual or economic activities. As such, the design must create the space to support a sustainable community, most critically when one is dealing with the poor.

Larry English is director of Program Design and Development for HFH in Africa and the Middle East. Kate Bistline is research and evaluation specialist for HFH in Africa and the Middle East.

The Forum
Volume 13 Number 2
The Forum is published quarterly in English, Spanish and Portuguese

Editor:
Anita Mellott

Copy editor:
Heather Wilkinson

Graphic designer:
Debbie Nessamar

Portuguese and Spanish translations:
Translation Station, Inc.

Adviser:
Karan Kennedy

Distribution manager:
Nancy Barnes: NBarnes@habitat.org

Editorial policy:
We welcome the submission of articles, photos, news items and ideas. For more information, please e-mail The Forum@habitat.org or AMellott@habitat.org.

Mission statement
"The Forum" exists to enable the worldwide partners of Habitat for Humanity International to accomplish its mission by providing a means to:
- Promote discussion, the exchange of ideas and best practices, and knowledge sharing;
- Share concerns and challenge our standard ways of doing things; and
- Explore different methodologies and issues relating to housing and poverty worldwide.

Habitat for Humanity®

121 Habitat St., Americus, GA 31709-3498 USA

What is environmental impact?

The topic for this issue of "The Forum" is **Environmental Impact on Housing and Construction Innovations**. In exploring this theme, we realized right away that it would cause confusion. Most people think about "environmental impact" in terms of how their program or intervention is impacting the environment, but we wanted to explore how local environments are impacting the Habitat program and the construction innovations that result when we steadfastly focus on serving the poor.

As we explored the topic, we realized that many of the words we use have multiple meanings depending on the local context — what do we mean when we use words like sustainable, durable, affordable, decent houses and decent communities? How do we balance affordability and durability? What makes a community sustainable?

The articles in this issue underscore **three approaches** that Habitat for Humanity is taking as we struggle with these questions.

1 **Building community through partnerships:** In Turkey, an innovative project combines the efforts of the private sector, academics and local government to build a sustainable community for victims of the 1999 earthquake. In China, Habitat for Humanity partners with the Yunnan Disabled People's Federation, Leprosy Mission International and local government to build houses and community structures specifically designed for leprosy-affected people. Both projects are not only building decent housing but also addressing the spiritual, social and economic needs that are essential to decent communities.

2 **Improving on traditional technologies to lower house costs and serve a lower income group:** In Kyrgyzstan, a cane reed technology is revived and combined with an innovative under-the-floor heating system to produce a house that is low in cost and energy efficient. In Mozambique, a caniço reed house is designed with a concrete floor and tin roof to produce a low-cost house that is also durable and half the cost of the normal Habitat house. In Mexico and Honduras, soil-compressed blocks replace the more expensive cement blocks. This technology has been used by Habitat in Africa for many years and is reminiscent of the adobe construction that is traditional in Latin America/Caribbean.

3 **Using renewable, low-cost energy sources:** For Habitat East Bay in San Francisco, California (USA), sustainable means "green" building. This affiliate illustrates how using energy efficient building technologies can produce a house that is affordable and save on energy costs for years to come. In Armenia, solar-powered water heater systems save Habitat homeowners as much as 20 percent of monthly income, the cost of heating water in homemade immersion electrical boilers that are not only costly but unsafe.

While it is interesting to find commonalities in our approaches, it is inspiring to note the diversity and how solutions are tailored to specific needs. Even as Habitat is searching for innovative ways to "scale up," it is still true that innovation also comes from the compassionate efforts of Peace Corps volunteers working with Habitat to help Teresa Timba build a decent home for her three children.

Karan Kennedy and Anita Mellott

Defining sustainability

by Jonathan Reckford

This edition of "The Forum" explores interactions between housing and the environmental context in which it is built. With this in mind, I would like to offer a few thoughts of my own regarding the concept of sustainability. Habitat for Humanity International's board of directors recently approved HFH's five-year strategic plan. The phrases "decent communities" and "decent, safe, affordable housing" can be found throughout the stated principles, mission and vision. The last of HFH's six adopted principles in this plan is to "promote transformational and sustainable community development" *(see http://partnernet.habitat.org/)*.

Habitat for Humanity Mission and Focus Principle 6

> "promote transformational and sustainable community development"

From a construction standpoint, particularly in the United States, Habitat for Humanity has defined sustainability largely as green building, describing it as "the process of building houses in a way that lessens the detrimental impact on the natural environment," including reducing waste, reusing and recycling materials, reducing long-term energy consumption of the house, using healthier and more durable building products and methods, and managing build sites wisely.

HFH FILE PHOTO

Jonathan Reckford, CEO of Habitat for Humanity International, attends a Habitat house dedication in Thailand.

However, in the context of the HFHI strategic plan, we talk about "impact sustainability," defined as the result of "strategically chosen interventions that create lasting reductions in poverty and unconscionable housing situations." As a global organization, we recognize that "sustainable," "community" and "development" form an important, integrated triangle. The many complex factors that shape a community — including cultural norms, economic factors and the natural environment — all play a critical role in how effective any intervention will be in addressing the housing need.

The United Nations' World Commission on Environment and Development has defined sustainable development as "development that meets the need of the present without compromising the ability of future generations to meet their own needs." The nonprofit Rand Corporation defines sustainable development in detail, stating: "Most sustainable community definitions focus on long-term integrated systems approaches, healthy communities, and quality-of-life issues by addressing economic, environmental and social issues. The concept recognizes that economic, environmental and social issues are interdependent and integrated" (*http://www.rand.org/*).

Leading nonprofit community development organizations operate with these key concepts in mind, and Habitat for Humanity is and should be no different. In order to reach our goal of eliminating poverty housing, Habitat for Humanity must become an expert in assessing local context, seeking out compatible partners, and implementing innovative, appropriate, cost-effective and sustainable solutions that will move people from substandard housing to improved living conditions. The solutions might be in the form of advocacy, incremental repairs, tapping into government subsidies, micro-finance initiatives, a partnership with a community-based organization that is providing health or educational programs, or improving on a traditional technology that takes advantage of local resources and homeowner sweat equity.

I invite and challenge our Habitat board, leaders, staff and volunteers to help us further define, explore and examine these issues of sustainability. The more we do so together, the better we will be at providing a "safe, decent and affordable" place for everyone to live.

Jonathan Reckford is the CEO of Habitat for Humanity International.

MOZAMBIQUE:

Caniço reed houses on Inhaca Island

by Andrew Lind

Teresa Timba and her three children live on Inhaca Island, Mozambique. In my role as a Peace Corps volunteer I had asked her neighbor, Agnes, to identify poor families with orphans and vulnerable children so I could help them plant nutritional gardens. One day, at the end of June 2005, Agnes introduced me to Teresa. I was shocked at her "house" — a shack that bent at a 45-degree angle into the trunk of a fallen tree. I assigned Agnes the task of teaching Teresa how to dig four nutritional garden plots and fill them with organic waste, readying them for planting.

Two weeks later, I returned with the newly arrived Peace Corps volunteer, Daniel Lyons. To my surprise, I noticed that the house that lay against the tree was no longer there; now the family was living in what had been a makeshift kitchen. Both Daniel and I were disturbed that the children were covered in bites and scabs. Sleeping on sand, the children had infestations including mange, scabies and mataquenhas.[1] Teresa had no income, and the children had all been abandoned by their fathers. Planting a garden seemed like a joke in light of the family's situation. The family needed a house with a cement floor, a latrine and some income to survive, but we had no means by which to provide them with this. In the conventional Habitat system, single bedroom cement-brick houses cost around US$2,000 that needs to be repaid. Teresa could not possibly afford to enter into a housing mortgage.

WITH SPORADIC INCOMES AVERAGING LESS THAN US$20 A MONTH, THESE WOMEN COULD NOT AFFORD TO BUY INTO US$1,800 MORTGAGES.

The reality

During 2005, project officer Aida Tembe, Daniel and I had been discussing the possibility of creating a US$1,000 house. Through a grant from the Allen and Nesta Ferguson Foundation, the Inhaca affiliate was building houses for single mothers and widows. But recently, the numbers of women interested in receiving homes had been decreasing. Only three who would finish houses by the end of August with the help of two Global Village teams had a steady income (close to US$40 a month, the minimum wage in Mozambique). The remaining single mothers and widows — the majority of the population on Inhaca according to the local administrator — earned incomes through cutting firewood, selling shrimp and crab, and doing odd jobs. With sporadic incomes averaging less than US$20 a month, these women could not afford to buy into US$1,800 mortgages. After building six houses for women-headed families, the affiliate would not be able to finish its 10-house goal simply because there were no more eligible beneficiaries. (Eligibility was defined by the ability to pay although, in reality, plenty of single and widowed mothers needed homes.)

Innovation

In order to create a US$1,000 house, the amount of cement used on a house — the most expensive material

Continued on page 6

Mozambique: Caniço reed houses on Inhaca Island
Continued from page 5

Habitat uses — had to be decreased. Local housing on Inhaca is made of caniço, a type of reed that grows locally and in the mainland fields of Machangulo (a 10-minute boat ride away). The houses are constructed with vertical wood pillars and horizontal sticks that hold the reeds together. Roofs are usually made with a grass thatching. These houses only last about three years before they must be rebuilt, but they only cost a couple hundred dollars.

Habitat wanted to build a low-cost house with caniço walls, but not reduce durability. Aida, the Peace Corps volunteers and HFH Mozambique architects began designs on a caniço house that would last longer. The first step involved the need for a full foundation and floor; this would allow the caniço to rest on cement and keep it from rotting from the bottom up, the primary problem with caniço houses. This would also provide a base for any further building in the future should the family decide, or be able, to build with cement blocks. Further, if the houses had quality tin roofs, the caniço would also be protected from leaks when it rained, reducing rot and wear. (It is hard to get good quality thatch for roofing in southern Mozambique.) The final designs that came out involved a foundation and cement bricks that came up about 2 ft from the ground, caniço walls, and a tin roof.

KIM MACDONALD

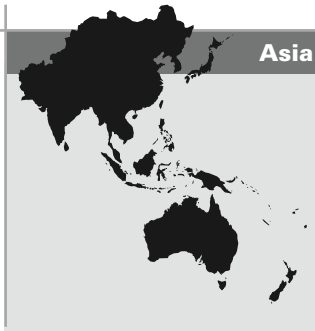
Reducing the cost of building through innovative house design is helping women heads of household in Mozambique qualify for mortgages they can repay.

Unfortunately, part of the original HFH Mozambique plan on Inhaca had been the introduction of cement brick homes and latrines. Aida, once the president of the affiliate, noted that caniço homes were not necessarily going to be viewed as a positive strategic change, especially by members of the local government. Many people associated HFH Mozambique with "high quality cement houses." Caniço houses were viewed as temporary and of poor quality. Still, Aida herself had recently helped a widow, Anasse, who had no place to sleep. Anasse had been living in conditions similar to Teresa when Aida met her. With help from the local community, Aida had gathered enough donations to supply Anasse with a caniço hut. A year later, a Global Village team paid for and built a cement floor for Anasse's house. Aida had already set the precedent for community acceptance of intervention actions for the poorest of the poor.

Plans were set in motion to offer the caniço houses to widows and single women-headed households. Ten women who worked occasionally as community cleaners for the Ministry of Social Action were brought into the project. They were informed of the estimated house cost and asked if they would be interested. All responded positively to the possibility of receiving a caniço house but, within weeks, all backed out because of fears over repayment problems. Not understanding the difference in the cost of their proposed house and the conventional cement-block homes, they took the Inhaca affiliate's problems with some of the cement house owner repayments to mean similar problems for themselves. The women realized the gravity of a commitment to repay but did not yet understand the cost difference between cement and caniço houses.

At the same time, Peace Corps volunteer Daniel Lyons had been visiting Teresa. Realizing that she had rebuilt her makeshift home three times during the past six months, he wrote a letter to the August Global Village team asking for donations to help fund a house for Teresa. HFH Mozambique took a risk in planning an "intervention home" for Teresa. Since she could not possibly pay a full mortgage, the affiliate would build a single room caniço house and latrine for her family. The result was small in comparison to other HFH Mozambique homes — even the standard reed models — but much better and more durable than her current home.

Continued on page 20



HFH builds for the disabled in China

by Wong Hiew Peng

Among the developing countries in the world, China can take pride in its dramatic large-scale reduction of poverty. Using the World Bank's poverty measure of living on less than US$1 per day, the number of poor in China is estimated to have dropped from 490 million in 1982 to 88 million in 2002.

The world's most populous country has its rapid annual economic growth of more than 9 percent (1979–2003) to thank for its successful reduction of poverty. Reforms and structural changes since 1978, in turn, played a key role in spurring economic growth.

According to a case study presented at the Shanghai Poverty Conference in 2004, poverty is a rural phenomenon in China with 80 million of China's rural population remaining poor. During the 1990s, China's rural poor population shrank and was further concentrated in the western regions. The southwestern province of Yunnan had a 9.4 percent share of China's rural poor in 1994, topping the list of 31 provinces.

MIKEL FLAMM

A disabled homepartner from Changliu village, Guangdong, China, contributes sweat equity for the construction of his house.

It was in Yunnan that Habitat for Humanity chose to start its China operations in 2002. In the Yunnan Disabled People's Federation, Habitat found a partner that is equally committed to improving the inadequate housing of the disabled in the province.

Yunnan is also home to many of China's 800 leprosy villages in which people who have been seriously affected by the disease have lived since the 1960s and 1970s. Though many of those who have been afflicted have been cured, more than half of China's 230,000 leprosy-affected people were left with permanent eye damage and disabilities. Leaving an indelible mark also is the social stigma that leprosy-affected people have to endure.

According to Professor Yang Lihe, a retired leprosy specialist, residents of leprosy villages in China were not normally issued with household registration certificates (*hukou*) or official identity cards (*shenfenzheng*). For all official purposes, leprosy-affected people could well be invisible.

But their plight is clear to Habitat and its partners that include the Yunnan Disabled People's Federation, the Leprosy Mission International and county governments. Since 2003, more than 100 families in various leprosy villages in Yunnan have benefited from the houses that Habitat and its partners have built.

Encouraged by the positive results of its Yunnan programs, Habitat extended its presence in China by setting up project offices in the neighboring Guangdong province in 2004 and Guangxi province in 2005. While the Guangxi project office develops

Continued on page 8

HFH builds for the disabled in China
Continued from page 7

work projects throughout rural communities in the poor province, the Guangdong project office serves families in disadvantaged areas.

In 2005, the Guangxi office launched its first project in partnership with the Leprosy Mission International to build 10 new homes for elderly villagers in Dingwo Leprosy Village. When it was first founded in 1956, Dingwo Leprosy Village had more than 150 inhabitants.

BRYAN WHITHALL

A Habitat homepartner in Guangxi, China, is pictured in front of an inadequate mud-brick house.

In the early 1980s, as new treatment for leprosy became widely available, the villagers were pushed to return to their families in the countryside. Over the years, the numbers dwindled as 80 percent of inhabitants recovered and returned to their own homes and others died. Those who had no homes to return to or were completely rejected by their families stayed behind and made do with a meager government subsidy. By 2005, the remaining 10 inhabitants faced problems of leaking roofs and a lack of clean water as well as sanitation facilities. Security was also a problem as people from surrounding villages were suspected of stealing things from the leprosy-affected people.

For the Dingwo project, Habitat constructed 10 28-square-meter homes in a courtyard design with a public bathroom and a 40-meter-deep drinking water well. The courtyard design and activities room with a TV and DVD player encourage the villagers to interact more with each other. The design enhances security by allowing residents to lock the steel gate at night. The residents are using their old homes that were left intact to raise animals through microfinance loans from Habitat.

The single story houses that Habitat built for leprosy sufferers in Yunnan, Guangdong and Guangxi are not very different from other houses in these regions. They are generally smaller than typical houses, ranging from 20 to 80 square meters in size, with one or two bedrooms and a separate kitchen area.

House designs vary from village to village and from project to project but hygiene is a key consideration. For example, in houses built for leprosy-affected people, a tiled or concrete floor will take the place of the usual dirt floor of a typical house for the poor. Habitat will also ensure that all the surfaces of the houses have edges smoothened by high quality plastering and tiling. This is to prevent further injuries to leprosy-affected people who have lost feeling in their affected limbs. In the kitchen area, the stoves are built with chimneys to direct smoke away from the sensitive eyes of leprosy-affected people.

The toilets are specially designed with new tiling and proper flushing to improve cleanliness and reduce the risk of infection for the leprosy-affected people who have open wounds. In view of their disabilities, communal toilets for the use of three to four persons are also built. This enables more efficient cleaning and maintenance of the toilets through group effort.

In March 2006, Habitat and The Leprosy Mission International (TLMI) extended their partnership by agreeing to work on community development, micro-enterprise projects as well as providing housing for 46 leprosy-afflicted families and others with physical disabilities in the Guangxi Zhuang Autonomous Region. The five-year partnership that stretches to 2010 will see TLMI committing up to 100,000 pounds.

Over in nearby Guangdong province, Habitat's project office chose to launch its pilot project in Changliu, a village in the mountains about two hours' drive from the provincial capital, Guangzhou. The Guangzhou Disabled

People's Federation had referred Habitat to the village where Habitat evaluated individual needs, ability to repay loans under the Save & Build model, and willingness to participate in the scheme and contribute their own labor in the construction of the houses. The Save & Build model calls for the homepartners to save for one-third of the cost of the house while Habitat and its partners provide the remaining amounts.

Seven low-income families who rely on subsistence farming and have disabled members were selected for the Changliu project. Made of compressed earth bricks and dirt floors, their houses were dark, damp and dirty, with leaky ceilings and cracked walls.

The Yangs were the first family in Changliu to have their home built by Habitat. When the two-bedroom house was completed in July 2005, Yang Liutai said: "Hopefully the new room will be better for our health and lower our costs for medicine." His father is deaf and his mother is handicapped.

The Yang's new house also featured a flat cement roof which could be used to dry fruit such as plums and tangerines, the sale of which would help them repay the loan.

DANTAYLOR

Habitat houses built for the leprosy-affected have smooth edges on all the surfaces of the house and a tiled or concrete floor. Pictured here is a homepartner in the Chagen Leprosy Rehabilitation Village, Huazhou, Guangdong, China.

Despite their disabilities, many of Habitat's homepartners did not hesitate to render "sweat equity" — or their own labor — in the construction of their homes. While they may be unable to take on more strenuous tasks, many often helped to carry bricks to the build site, remove debris or plaster the walls.

In December 2005, the Guangdong project office continued to work with the disabled in Shiling village, Guangzhou, by launching a six-house project for families both with and without disabled members. This served to increase the acceptance and integration of families with disabilities into the larger community.

Besides the disabled in Guangdong, Habitat also provided assistance to families with leprosy and disabilities in a leprosy village south of the province. Habitat is involved in the construction of 24 homes in cooperation with the Lions Club International Foundation and Guangdong Lions Club.

Just as Chinese president Hu Jintao called upon the entire Chinese society to respect, care for and help the disabled, Habitat and its partners are playing a key role to address the needs of this group of people. With decent and safe shelters, the disabled — including the leprosy-affected people — can take better care of their health, improve their means of livelihood and live with dignity.

Wong Hiew Peng is a writer/editor for HFH in Asia and the Pacific.

Habitat for Humanity Vanuatu explores construction techniques

by Vanessa J. Daniel

Vanuatu is an independent republic consisting of 83 tropical islands east of Australia and west of Fiji, with a population of over 200,000 (mostly Melanesian people). A teetering infrastructure was left behind by the French and British who, until 1980 when it was known as "The New Hebrides," jointly ruled the nation. Although many of the people live throughout Vanuatu, the eight largest islands — which account for 80 percent of the land mass — are 95 percent populated. Recently, however, there has been a lure to the urban areas and especially to the capital, Port Vila. Tourism is the main industry.

HFH VANUATU

A typical substandard house in Vanuatu.

In 2001, Habitat for Humanity set up a national office in Port Vila. Housing is a major challenge for the island nation. Often corrugated metal leans together to act as walls creating shanties. A common room will house a multi-generational family with extended members sharing the space. Woven grass mats are placed on the ground at night for beds and the only kitchen is outdoors. If the community is fortunate enough to have running water, the tap is shared by many families. Bathrooms are also often shared by a number of people and can, at times, be bush toilets. There are no doors into these homes, just calico material flapping in the breeze. Large rocks hold roofs in place but only during the good weather. These dwellings are, obviously, extremely susceptible to cyclones. Needless to say, overcrowding and unhealthy and unsanitary living conditions are an issue making Habitat for Humanity Vanuatu essential in the cities.[1]

Meanwhile, rural areas tend to be filled with mostly traditional houses built from local materials (bamboo, grass and thatch). Although charming, they not only pose a security issue but are also vulnerable to pests, flooding and cyclones. In February 2004, for example, Hurricane Ivy damaged more than 10,700 houses on 13 islands. HFH Vanuatu vowed to offer a hand up.

In addition to the poor living conditions and climatic influences, the scattered archipelago consists of mostly volcanic islands, thus adding geological considerations to the list of challenges facing HFH Vanuatu. But social/economic circumstances remain the biggest test. Land disputes between tribes and a rapidly growing population mean there is a shortage of affordable land for

affordable housing. Poor families seeking decent homes have to contend with high land prices, costly building materials (especially when imported) and a lack of assets to secure land ownership. The Habitat for Humanity North American model has had to adapt and become flexible for survival.

For the disabled, homeownership is even more difficult as they tend to be less employable with fewer resources available to them. Over the past three years, HFH Vanuatu has helped target this portion of society and has built houses for the blind and physically disabled. Additionally, a prototype disabled washroom is being designed for future recipients.

Since its inception, HFH Vanuatu has undergone an evolution in building construction, constantly upgrading and streamlining its methods to become more and more efficient. In 2004, Concrete Interlocking Block technology from the Philippines replaced plaster and block homes, which had replaced local rock (time consuming and expensive) homes. The CIB homes are earthquake- and cyclone-proof, made from imported cement with local sand and coral. They are easy to assemble and can be made in advance by students

Continued on page 12

HFH VANUATU

HFH Vanuatu uses tiles made out of cement rather than metal. These strong, hurricane-proof tiles can be made on site.

HFH Vanuatu explores innovative construction techniques

Continued from page 11

(as a six-week learning course) or on site by volunteers (like with the Global Village team from Hong Kong this March) or by homeowners (as part of their sweat equity). As a result, the average cost of a home has been cut. Furthermore, a new roof technology from the UK, but used internationally, was introduced last November. This technology uses cement tiles, which are better than metal because cement is stronger, hurricane-proof and can be made on site. Also, the steeper pitch allows for better airflow, which is needed in this humid, tropical country. The stronger, more elegant tiles are now being implemented in most new home construction. Again, they are locally made by students, volunteers and homeowners.

TOM HAYES

At the Habitat Building Center in the Tagabe community near Port Vila in February 2005, these young women attended a workshop for women only to learn to make Concrete Interlocking Blocks, which will be used in house construction.

Looking ahead, HFH Vanuatu aims to continue to improve its building techniques for sustainable living, empower the community with home-building skills and focus on helping more of the disenfranchised. Currently, fund-raising campaigns are underway in Santo for the construction of a regional office, and by Vanuatu Independence Day festivities at the end of July this year our national office (which is currently in the planning stages) should be complete and opening its doors for a celebration of our own.

Vanessa Daniel is an architectural consultant with HFH in the South Pacific.

1 Depending on the locale and needs of the homepartners, HFH houses typically have cement slab foundations and are made from concrete blocks and wood, with hardwood frames and shutters. Corrugated iron is used for the roofing.

HFH VANUATU:

Concrete Interlocking Block technology

Imported from the Philippines, the Concrete Interlocking Block technology was introduced to HFH Vanuatu at the end of 2004 with the hope that it would be part of the poverty housing solution on the Pacific island.

The new technology will save approximately one-fifth on the cost of cement used in the average house build in Vanuatu, which will reduce construction costs. A bag of cement costs between 900 and 1,000 Vatus in Vanuatu (approximately US$9). In comparison, a same-size bag costs an equivalent of about 300 Vatus in the Philippines (approximately US$3).

The CIB technology is easier to use because the blocks do not require continual leveling like hollow concrete blocks. Hollow concrete blocks must be constantly leveled as they are set in place, but because mortar is not used between concrete interlocking blocks, this is eliminated. In the CIB technology, the blocks are joined by steel rebar and concrete poured through holes inside the blocks.

Vivianne Licht, HFH Vanuatu's acting national director who participated in a CIB technology workshop, said the technology was ideal in many ways. "I can see mothers in local village communities sitting on their mats outside, working with their children to produce blocks for their own homes," she said.

HFH VANUATU

Using local raw materials like coral (pictured here) and sand has helped HFH Vanuatu to reduce house costs.

Wong Hiew Peng is a writer/editor for HFH in Asia and the Pacific.

COMPETING WITH INNOVATION:

HFH Armenia and HFH Kyrgyzstan in the World Development Marketplace

by Jelica Vesic

Editor's note:
Habitat for Humanity Kyrgyzstan recently became one of 30 winners of the prestigious World Bank Development Marketplace competition, a competitive grant program that funds innovative, small-scale development projects that deliver results and show potential to be expanded or replicated. This year's marketplace awarded US$4 million for the best for the poor in developing countries. In addition, Habitat for Humanity Armenia was among 118 grant finalists for its project "Harnessing the Sun: Energy for the Armenian Poor," chosen from 2,500 applicants from 55 countries worldwide.

HFH Armenia and HFH Kyrgyzstan have been selected among 2,000 applications for the final round of the World Bank proposal competition, World Development Marketplace. This article gives an overview of the innovative construction ideas that have brought them to the finals.

Armenia: access to hot water for vulnerable households through solar energy

People in poverty often spend more of their family income on energy services than wealthy households. In Armenia, rural communities in remote or low-density areas are particularly vulnerable due to the exorbitant costs associated with connecting to an energy grid. Families across Armenia resort to unsafe heating practices, which have a direct impact on the income, health, education and environment of vulnerable rural communities. Dilapidated homemade systems place enormous demands on power supplies and local forests, as well as pose a physical threat to users.

An average of 20 percent of household energy use is for heating water while vulnerable families barely produce enough hot water for their basic needs. Water is heated with homemade immersion electrical boilers and by burning wood in makeshift ovens. Immersion electrical boilers are extremely dangerous, especially if there are children — there is a constant threat of electric shock or explosion. In addition to these safety concerns, the boilers consume astronomical levels of electrical energy and are scarcely affordable for an average Armenian family. Wood-burning, kerosene and diesel oil heaters lead to health problems as well as degraded local forests.

STEFFAN HACKER

To reduce building costs, HFH Kyrgyzstan is using the traditional cane reed house-building technology that was common in the 19th century. This abundant material is friendly to the environment, local economy, volunteer labor force and community.

According to the national gas supplier ArmRusGasArd, about 70 percent of the Armenian population has access

Continued on page 14

HFH Armenia and HFH Kyrgyzstan in the World Development Marketplace

Continued from page 13

to a natural gas supply; of Habitat's partner families, only 5 percent have access.

Expanding on its work to eliminate poverty housing, Habitat Armenia is introducing a traditionally expensive technology to vulnerable households. (Though expensive from the point of view of individual families, once installed, the solar panels require no additional costs, and families can pay for the system in installments every month as part of a no-interest loan.) Quick and easy to install and maintain, the unique solar-powered systems will give affordable hot water access to 127 vulnerable households. Families will repay the cost of the system in less than 8 years; once installed, families have no further recurring costs for heating water. Twelve communities will be educated in clean energy sources, raising awareness of the positive effects on income, health, education and the environment. This project has the potential to reach more than 10,000 households throughout Armenia, and to easily replicate it across the region and establish solar heating systems to the wider Armenian market. This project is an innovative commercial-nonprofit partnership — a pioneer in social business.

Project Highlights

- Sustainable solar water heater systems will be installed in 127 safe, decent, affordable homes.
- Families will save 20 percent of monthly household income in electricity costs.
- Health complaints will be reduced by 15 percent.
- Families will use 1.5 cubic meters less wood per year.
- Sale of renewable energy systems will increase by 5 percent.
- Clean energy awareness in our communities will increase by 65 percent.

Kyrgyzstan: environmentally friendly housing coupled with cost-saving heating

In Kyrgyzstan, building a home is almost unaffordable, and house heating costs amount to up to 50 percent of an average family's earnings.

To reduce building costs, HFH Kyrgyzstan reverted to the traditional cane reed house building technology common in the 19th century, but forgotten in the 20th. Using this technology, families will save about 40 percent on construction costs.

In a country with long and harsh winters, spending half of the household income on heating is a reality for most families. Electric heating is clean but dangerous, because often makeshift furnaces are used; it is also out of reach for most families because of the high cost. The traditional solid fuel heating, used by 80 percent of the population is cheaper, but pollutes, does not properly heat all the rooms, and can be fatal through carbon-di-oxide poisoning. Additionally, it causes deforestation and depletes coal reserves. In addition to this, women

STEFFAN HACKER

Volunteers from the U.S. Air Force base work with cane reed.

and children generally spend much of their valuable time gathering firewood. As solid fuel heating involves little cost, families ignore or are unaware of the environmental and physical risks. Their main concern is to heat the house and still have enough to eat.

To reduce energy consumption, HFH Kyrgyzstan uses an innovative under-the-floor heating system which, when combined with the cane reed construction, saves 75 percent on energy costs, is clean, simple to use, easy to install and reduces pollution. This combination encourages the revival of a traditional cost-effective construction and the utilization of locally available resources.

The innovation is the combination of old technology, using cane reed for building houses, with new technology, the innovative coiled-circuit-under-floor heating system. Contrary to the 19th century method, Habitat builds the house with a timber frame filled with cane, reeds and clay. This construction has improved insulating properties, is seismically stable and meets local building codes. It is low cost and minimizes the environmental impacts. The floor heating system is unique as it uses extra thin locally produced pipes, thus minimizing the volume of circulated water. A further innovation is the laying of the floor and the heating system in one step.

Continued on page 20

Habitat East Bay builds "green"

by Patti Wang

Habitat for Humanity East Bay is located in the San Francisco Bay area in Northern California. Habitat East Bay experimented with sustainable building techniques for years, and then made a solid commitment to building "green" in 2002 with a development of four homes in the city of Oakland. That small development was the training ground for full scale green construction going forward. Today Habitat East Bay only builds sustainable housing and on a much larger scale.

HFH EAST BAY

Habitat East Bay uses photovoltaic panels, making homeowners' electric bills minimal.

"We are currently working on a 22-home green project in the city of Livermore and a 26-home sustainable development in Oakland," says Janice Jensen, Habitat East Bay's executive director. "We build green to take better care of our environment, our homeowners and our volunteers. It's also a smart, cost-effective way to build."

Green building is a "whole-systems" approach for designing and constructing homes that conserve energy, water and material resources. Habitat East Bay's sustainable building techniques include:

- Using sun and wind to the building's advantage for natural heating, cooling and lighting
- Landscaping with native plants and incorporating bioswale[1] drainage systems
- Building durable structures
- Insulating well and ventilating appropriately
- Incorporating salvaged, recycled and sustainably harvested materials
- Maintaining healthy indoor air quality with low-VOC[2] finishes/sealants, materials
- Using energy-efficient and water-saving appliances and fixtures
- Reducing and recycling construction waste

At Habitat East Bay's Livermore development the homes were designed with most of the windows and living space facing south, which allows natural heating in the winter and cooling in summer through a thermal mass concrete slab. Ventilating skylights help cool and aerate the house in hot weather. Photovoltaic electrical systems collect the sun's energy and convert it into electricity. This system is nearly maintenance free and can eliminate monthly electric bills. The use of fly ash in the concrete, engineered lumber, raised heel roof trusses and 24" on center framing are other sustainable building techniques utilized.

Some have wondered if green building is too expensive for Habitat homes. Habitat East Bay has repeatedly proven that the "too expensive" concern of green building is a myth. Affiliates do not have to spend enormous sums of money to build environmentally sustainable homes. Green building can be accomplished on various budget levels. Many sustainable materials are comparable in price to their traditional counterparts; it's just a matter of choice.

As Habitat East Bay looks toward the future they plan to continue building green while improving their construction methods. They are also working to develop techniques to pass on to other interested Habitat affiliates. They have an active committee called the Green Team that works behind the scenes to further develop the program and educate homeowners on the simple methods to maintain their green home.

"Environmental consciousness is not just a concept to us," says Jensen. "We are committed to the stewardship of our environment, homes and homeowners, and we take this commitment very seriously. Being green is part of who we are at Habitat East Bay. I hope many more builders will join us."

Patti Wang is the marketing and development officer at HFH East Bay.

[1]The Livermore site was graded so that all water runoff would be directed to the bioswale, which is a thin strip of landscaped soil that filters the water before it returns to the water table. This naturally removes pollutants that would otherwise run into the city's storm water drains. The plants used to landscape both the bioswale and the rest of the site are native to the area, used to the dry climate and do not require extra irrigation in the dry season thus conserving water

[2]VOC stands for Volatile Organic Compounds—the chemicals that are emitted by paint, insulation and some flooring. Studies have been done that show these chemicals can be detrimental to a person's health and may contribute to higher cancer and asthma rates. HFH East Bay tries to use low VOC products when possible.

BERIKÖY:

Communities building communities

by Barbara M. Brady

In the aftermath of the devastating 1999 earthquakes that hit the Adapazari region of Turkey (about 70 km east of Istanbul), the "Beriköy: Communities Building Communities" project was created to address the long-term housing, unemployment, environmental and socio-economic issues that would ensue. The primary aim of the project is to empower the disenfranchised, create jobs and promote future sustainable development through what is seen both as a tool and an end product in and of itself: coming together as a community to build a community of homes. Beriköy, which roughly translates to "our town," is a pilot project to create long-term sustainable communities in a way that brings together beneficiaries, the public and private sectors, academia, and local government to work together, literally from the ground up.

"Ultimately, Beriköy will sow seeds that will grow into a realistic, obtainable and well-balanced community development concept for all of Turkey," says Rukiye Devres Unver, project co-founder and current president of the YAY[1] Foundation.

MUGE OZDEMIR

Groundbreaking at Beriköy.

This project in Adapazari began to develop immediately after the first 1999 earthquake when architecture professor Jan Wampler of MIT contacted two of his former students — Rukiye Devres Unver and Barbara Brady — who were working in Istanbul. The three worked to develop a workshop[2], which Professor Wampler guided at the Massachusetts Institute of Technology and for which Devres and Brady acted as liaisons to Turkey. The workshop, comprised of several MIT students from the architecture, urban planning, and other departments working under Professor Wampler, visited Turkey a number of times and worked with earthquake victims to understand local needs and culture. The goal was to develop a project that would do more than just build houses, but which would build *homes* and work with people after the tragedy to re-engage their lives and livelihoods in a dignified, empowering and sustainable way.

During the first year after the earthquake, an initial project for 50 homes and a community center was developed. The resulting scheme that incorporated the continued involvement of beneficiary families had three main goals:

- involvement in project development and construction as a way to empower beneficiary families with an understanding of safe and economic construction methods

- to develop a sense of ownership in the project, critical skills for future employment
- to develop a financial model which would help to bring down the cost of the homes

The project also involved local businesses in contributing time and materials to the project, allowing them to also build dignity, pride and a stake in the success of the project. Like Habitat for Humanity, the project required recipients to make payments toward ownership over time to an enabling fund that would contribute to the construction of more homes.

Since many of the concepts and goals were similar to that of Habitat for Humanity, and as Habitat for Humanity International was interested in becoming involved in Turkey, it was natural for a partnership to develop to realize these goals. Dedicated HFHI staff and the team of Wampler, Devres, Brady and Halim Neyzi — a local businessman who joined the founding team — also joined forces with a Turkish foundation of complementary mission, CEKUL, in the process of developing a roadmap for the legal, financial, and physical infrastructure necessary to make the implementation of this project a reality. As a result, in 2003, the Adapazari project steering committee created the YAY Foundation to be the local arm of implementation and partner of Habitat for Humanity International in the process. Local subcommittees that had developed were included in this.

The design of Beriköy and its overall scheme include environmentally and culturally sensitive design with efficient use of energy through both active (power generation and use) and passive (design orientation, insulation, size/quality, and location of windows and shading) means. Special effort was made to efficiently use indoor and outdoor space (homes range from 70 to 90 square meters) while still being sensitive to social customs of privacy in certain areas. The design also incorporates the eventual integration of renewable energy through solar power and reuse of resources such as rainwater and greywater (water from kitchen and wash areas or clean, filtered effluent from some septic systems) for irrigation of gardens. There are a variety of community spaces, and opportunities for the development of small businesses and micro-industry within the community to address the socio-economic needs of families and to allow women the chance to work within the community. The scope of this scheme and attention to design is made possible by the cooperation and support of complementary groups from many sectors of society (housing, academia, construction, social support and micro-industry) and allows each to contribute their specialty and act in an integrated manner toward the ultimate goal.

The construction method is clad light gauge steel frame which offers both flexibility, relative lightness and strength, and which is seen as an emerging industry in Turkey in which workers in the recipient families will be uniquely qualified to participate. The first eight Beriköy families moved into their new homes in May of 2004 in a beautiful ceremony full of smiles, tears, hugs, and a proud sense of community and accomplishment. Present were beneficiary families, the project partners, corporate sponsors, other donors, local and international press, and local government officials. Construction of the second phase started in the fall of 2005.

MUGE OZDEMIR

A typical house at Beriköy.

Beneficiary families for Beriköy were chosen in cooperation between a project family selection team and the department of sociology at a local university, Sakarya. After establishing criteria for groups that were most in need through extensive local interviews and discussions, a family selection committee worked with Sakarya University to define parameters for a transparent family selection process which drew greatly from HFHI experience in other parts of Europe and Asia. The process itself was finalized and supervised by the president of Sakarya University's sociology department through a non-biased application and interview

Continued on page 19

Compressed-earth-block walls in Mexico and Honduras

by Minor Rodríguez

Since June 2005 Habitat for Humanity Mexico has incorporated into its work methodology the production of compressed-earth blocks — a type of improved adobe. The blocks are made with a lime hardpan (called tepetate in Mexico), cement, chalk and water. Block production takes advantage of traditional techniques, while increasing resistance and quality through modern technology.

Production and use of compressed-earth-block walls has also begun in Honduras in the local Copán office, where the material has long been part of the zone's cultural and architectural heritage.

Benefits

The development of this construction technology and its application in home building has yielded many benefits for participating communities, such as:

Launch of a production project: The Los Tuxtlas affiliate, in the Mexican state of Veracruz, acquired and installed compressed-earth-block-production machinery. The facilities employ trained, qualified staff and produce 51,300 blocks per month for use in Habitat homes. Each Habitat home (39 m2) requires approximately 1,700 compressed-earth blocks. Unused blocks are sold on the local market at preferential prices.

Process mechanization: The mechanization of the compressed-earth-block process facilitated large-scale production and higher quality blocks that cost less to produce. An automated production line was acquired, including a crusher, sieve, mixer, mix transport belt and the main cutter, which produces blocks in 10 x 15 x 30 cm molds.

In addition to water, which keeps it moist, the mix is

DIANA RODRIGUEZ

HFH Mexico's production of compressed-earth blocks takes advantage of traditional techniques, while increasing resistance and quality through modern technology.

composed of the following proportion of materials:

Clay and lime (tepetate) — *six 5-gallon buckets*
Sand — *one 5-gallon bucket*
Cement — *half of a 50-kg sack*
Chalk — *half of a 25-kg sack*

There are three types of blocks: solid, two-core and U-shaped two-core. The two-core blocks can be reinforced with vertical 3/8" rebar and are suitable for pipe installations, and U-shaped blocks can be used with horizontal reinforcement.

On average, an eight-hour workday produces 2,000 to 2,400 blocks. Exceptional outputs can reach up to 3,000 blocks.

Cost savings compared to masonry walls: Considering the basic mix proportions for compressed-earth blocks, there is a savings of 15 percent to 20 percent per square meter over sand-cement blocks and traditional bricks. This is largely attributable to the cost of tepetate and cement in the zone.

Test blocks were made from a mix in which cement was substituted by chalk. To date, the major observed difference is the drying time: up to 40 percent more. Furthermore, testing revealed a compression strength of 45 kg/cm2, which meets the regional quality standards.

Better insulation properties: Compared to traditional blocks — made from a sand-cement base or mud bricks — compressed-earth blocks are better suited to extreme climates. This guarantees much more comfortable and appropriate temperatures inside homes.

More attractive houses: Buildings in several communities in Mexico and Honduras are often gray-looking because of the sand-cement-based construction materials used. Compressed-earth blocks, in contrast — thanks to an inexpensive and ecologically friendly sealant — create a durable and pleasant-looking wall.

Resistance to change

It was not easy to convince participating families to switch to this innovative technology. It required extensive communication efforts and persuasion, but satisfaction levels are now very high.

Minor Rodríguez (mrodriguez@habitat.org) is project manager for HFH in Latin America and the Caribbean. This article was based on information provided by the architect Juan Carlos Sapién, construction manager for HFH Mexico.

Beriköy: Communities building communities
Continued from page 17

process. Beriköy beneficiaries must not own rights to property and must demonstrate the ability to "pay back" both through monthly payments and "sweat equity."

Fund raising for Beriköy has been on many levels, from grassroots to corporate sponsorships and annual fund-raising events, and includes a full range from sweat equity and gifts in kind to direct financial donations. Many professional services have also been donated through partners. Fund-raising consultants have offered their time in Turkey, and HFHI has also provided knowledge and advice in this area. During the first phase of construction in 2004, many financial and corporate donors participated in the rich experience of helping through sweat equity, with corporate volunteers commenting on how positive the experience had been for both their company and employees.

Women from the beneficiary families have worked with Beriköy's family support staff to come up with the idea to make fine handmade paper to be sold. This special paper, which contains flower seeds and petals, is fashioned into invitations and greeting cards. All proceeds are given to the creators to contribute to their families' budgets.

Through the actual work to build it and the examples which it sets, Beriköy has inspired everybody who has touched it to believe in the power of community, dignity and respect. It has shown that, when incorporating these qualities into the prospect of building houses, that those houses become much more. They become the productive framework for solid, proud, and caring homes and communities.

Barbara M. Brady is the project co-founder and a member of the YAY Foundation.

For more information, please visit www.Beriköy.org.

[1]YAY, is an acronym for Yasanabilir Ortamlar Yaratma, which refers to communities building communities. For more information, visit the Web site at http://www.yay.org.tr/English/Sponsors.htm.

[2]Workshops in this context refer to elective design studios at the graduate level at MIT, offered by Professor Wampler. Students intensely focus on a real need/issue around the world and work with a local community to provide real architectural/social solutions for the community/communities in question.

HFH Armenia and HFH Kyrgyzstan in the World Development Marketplace

Continued from page 14

Project Highlights

- In a pilot project, 10 families — at least 60 people — will have simple, decent and affordable houses.
- Energy services will be improved and safe heating provided to at least 60 poor people, then to whole communities.
- One family will save up to US$60/month. With this money they can buy 490 loaves of bread, 20 kg of meat or 160 liters of milk. Thus, a family can feed all its members on the money that it saves. The savings can also be used to improve the living conditions of the families and secure the mortgage payments of US$15–$25 per month.
- The use of solid fuel will be reduced, resulting in less pollution and improving health.
- Respiratory illnesses resulting from damp, unheated, moldy rooms will no longer be a problem.
- The community saves up to 3,000 kilowatts per family, per month.
- Reed houses are seismically stable, which is particularly important in the mountainous regions of Kyrgyzstan.

Jelica Vesic is communications manager for HFH in Europe and Central Asia.

Caniço reed houses on Inhaca Island

Continued from page 6

The Global Village team gave generously towards the estimated US$1,000 house cost. In the end, though, the single room house, including a latrine, ended up costing just US$600. Aida worked with Teresa to create a repayment plan. Teresa's obligation is to repay 30 percent of the house cost paid through working directly for Habitat. Teresa would work for Habitat on Inhaca and be paid 50 percent of her wages, the other 50 percent going toward repayment. Teresa now has a small income and is paying off her debt. Teresa's life is visibly changed by the new home. Her old home was nothing more than caniço and sticks with see-through walls. Now she can sleep in her house without getting wet when it rains and her children no longer sleep in the sand and get bitten by bugs or other infestations. The new house is roughly twice the size of her old house.

The affiliate has recently finished four more caniço houses. The new owners are the same women who backed out on the first caniço project idea. After seeing Teresa's house and the cost, they came back one at a time to ask the affiliate for another chance at building their own homes. The new approach has given them far more options and a better ability to gauge their mortgages and pay off the houses. Maria, whose old caniço house burned down just after the father of her child died, asked the affiliate for a similar house to Teresa's: a one-room home for her and her only child. Lidia wanted a two-room house and took it upon herself to gather some of the necessary local
materials which drastically reduced the cost of her home.

Caniço houses on Inhaca have allowed the affiliate to choose beneficiaries based on desire and need rather than ability to pay off homes. Intervention homes, such as Teresa's, are chosen by the community and the Ministry of Social Action for those who cannot pay. HFHM then commits to giving these families the means to repay 30 percent of the mortgage — linking the affiliate's repayment success to finding work for and paying a family that has no income. Revolving fund caniço houses go toward families with incomes around US$16 a month. In both cases, the new house type allows the families to participate more fully in the process — gathering materials, understanding the actual cost of their homes, and knowing that they can afford to have a better place for their children.

Andrew Lind is a former Peace Corps volunteer. He now serves as Orphans and Vulnerable Children's program manager with HFH Mozambique.

[1]Mataquentas are fleas that burrow into the skin and lay an egg sack and must be dug out with needles.

"The Forum" needs *You!*

If you are interested in writing an article for "The Forum" on the topic below, or if you have any ideas for future topics, please e-mail *TheForum@habitat.org* or *AMellott@habitat.org* for further information.

2006

Number 4: *2006 UN Habitat/Millennium development goals*

Articles due: August 30, 2006

3498ENG/1150/PROG/5-06