

Cane-reed housing technology with cheap heating system for the poor

Kyrgyzstan
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Project Summary

Elevator Pitch

Concise Summary: Help us pitch this solution! Provide an explanation within 3-4 short sentences.

In Kyrgyzstan building a home is almost unaffordable and house heating costs amount up to 50% of an average family's earnings. To reduce building costs, we found the traditional cane reed house building technology common in the 19th century, but forgotten in the 20th. Using this technology, families save circa 40% on construction costs. To reduce energy consumption, we use an innovative under floor heating system, which combined with the cane reed construction, saves 75% 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. Kyrgyzstan is one of the poorest countries of the former Soviet Union. The country provides poor protection from harsh winters, yet families continue living under these inhumane conditions because they cannot afford something decent. Habitat for Humanity Kyrgyzstan is the only organization in the country, providing simple decent and affordable houses to the poor at no-interest, no-profit mortgage. During its seven years of existence Habitat Kyrgyzstan proved its acceptance by dedicating over 166 homes. Our immediate beneficiaries are low-income families in need of affordable housing.

About You

Location

Project Street Address
Project City
Project Province/State
Project Postal/Zip Code
Project Country

Your idea

Focus of activity

Technology

Start Year

2004

Positioning in the mosaic of solutions

Main barrier addressed

Low individual purchasing power

Main principle addressed

Radically lower the cost of the entire housing delivery process

Innovation

Description of housing product/service offering:

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Description of innovation:

The innovation is the combination of an old technology - use of cane reed for building houses ? with a new technology: the innovative coiled circuit

under floor heating system. Contrary to the 19th century method, we build 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 uses extra thin locally produced pipes, minimizing the volume of circulated water. A further innovation is the laying of the floor and the heating system in one step. The 'rule of thumb' in construction technology is: 'low construction costs deliver high running and maintenance costs' or 'high construction costs deliver low maintenance and running costs.' By combining the traditional cane, reed and clay construction technology, and the relatively new coiled circuit under floor heating system, we have achieved both low construction costs and low maintenance and heating costs without compromising the structural integrity of the home. We save circa 40% on construction costs and up to 75% on heating costs. Cane-reed houses are double cheaper than houses built from bricks, clay or concrete blocks. So far, we are not aware of any other domestic construction company in the region using the same or similar combined techniques.

Benefits to clients:

Habitat Kyrgyzstan builds simple, decent and affordable houses together with low-income families in need of housing. It is not uncommon that several hundred families apply for 10 new Habitat homes. The families are selected by a family selection committee from hundreds of applying eligible families. The families we select live under seriously substandard housing conditions, are willing and able to repay the interest free long term mortgage loan and are willing to actively take part in the building of the house. We also train the families before, during and after the building process. Topics cover issues from maintaining the household budget to building skills or house maintenance. Each family has to contribute 500 'sweat equity' hours toward completion of their future homes. After the houses are built, Habitat Kyrgyzstan provides them to these families for no-interest mortgage for 10-15 years.

Key operational partnerships:

Habitat Kyrgyzstan continuously partners with the government of Kyrgyzstan and City Council of Bishkek, the capital. Today 44 houses are built on a plot of land donated by the government in 2000. Next year we will start building more cane-reed houses on another plot of land of 600 m², valued at USD 20,000, donated by the City of Bishkek, and with technical support from our private partner Chelebi company. Our houses built with the new technology are highly appreciated by the Construction and Architecture Commission under the President of the Republic. The city's Architecture and Construction Committee supports us in designing the houses and getting authorizations and construction permits for project implementation. The municipality helps with provision of access to water and electricity. Chelebi is a Kyrgyz-Turkish joint venture, having been active in the Kyrgyz market since the late 90's. The company started its activities in Kyrgyzstan by selling construction materials. Two years ago they established a factory near Bishkek, producing water and sanitation pipes that we also use for our floor heating system. Chelebi represents a two-fold sustainability factor for us. On the one hand, they supply us diverse construction materials at considerably reduced prices, and their local production of pipes reduces our dependence on imported goods, on the other.

Impact

Financial model:

Our major financial resource is our revolving fund funded by donors and by the monthly mortgage repayments of all our homeowner families. The fund is used for the up-front investment. The loan bears no interest and has a life time of 15 years. Due to the savings of up to 60\$/month through this project, the families will be able to pay the monthly instalments, and the revolving fund will help us to help more poor families. Every year we increase the fund and the number of served families, so we will be able to help more poor families in communities, improve their homes with energy efficient heating systems.

Costs as percentage of income:

0

Financing:

Construction of cane-reed houses is financed by sponsorships and grants. In May 2006 Habitat Kyrgyzstan received a World Bank grant of \$116,000 for 10 cane-reed houses. We believe the project is financially sustainable because we have mortgage payments and designated funds allocated from the Habitat area office, apart from other Habitat affiliate tithes.

Effectiveness:

- Project outcomes: Since its establishment in 1999, Habitat Kyrgyzstan Foundation has provided over 166 families with decent place to live. Cane-reed technology was introduced in autumn 2004, and since then we build only cane-reed houses. Up till now we constructed 12 individual cane-reed houses and 4 duplexes for 8 families. By the end of this year we expect to finish 4 more duplexes.
- Number of clients in past year: Last year 9 families received a Habitat house. Since January of this year another 8 families moved into cane-reed houses.
- Percentage of clients that are poor or marginalized: 95%
- Potential demand: There is a high demand for Habitat houses because of its fair terms - no-interest, long-term loan. Since low-income families cannot afford buying a house or receiving a mortgage in a bank, they approach Habitat for help. Habitat families are selected on open-contest. Usually over 300 families apply for 15 houses. Cane-reed houses can be built in any region where cane-reeds grow. We intend to transfer this technology to neighboring Habitat affiliate in Tajikistan.

Scaling up strategy:

Stage of the initiative:

Scaling Up stage.

Expansion plan:

According to our strategic plan, we plan to complete at least 15 cane reed homes per year through 2009. The excess number of houses built with this method depends on the results of our fundraising efforts. We do not have project team capacity constraints at present, as Habitat Kyrgyzstan can expand the team with experienced Habitat colleagues, transferable to this project. We plan to expand this building method to our other affiliate in Barskoon. The necessary building materials and skills for building this new type of houses are accessible in several

Habitat- countries, thus the method can have a cross-border effect as well. The initiative can easily be transferred to neighbouring Habitat Tajikistan first. Building cane reed houses is highly replicable in any region where cane reed and timber are available. The construction process is simple, easy to learn (Habitat also builds with non-skilled volunteers under the supervision of a construction supervisor) and highly advisable in regions with high seismic activities. The floor heating system is cheap, easy to install, involves low electricity consumption, is safe, environmentally friendly and warm. It can be easily applied where electricity is available.

Origin of the initiative:

Habitat Kyrgyzstan always looks for alternatives to lower construction costs. Before 2004 we built houses from bricks. When prices for construction materials rapidly increased in early 2000's, we started to research for other construction technologies. We came across cane-reed houses and found construction engineers who were familiar with the technology. Cane-reed houses were widely built in 19th century. Today it is almost not used.

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