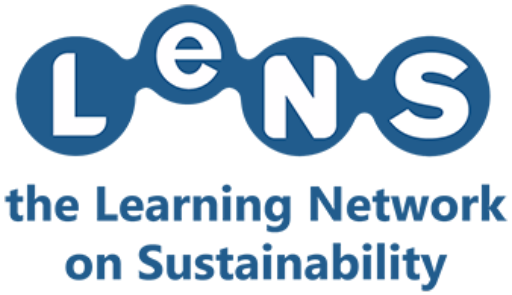

THE OPPORTUNITIES OF SUSTAINABLE HOUSING TO PROMOTE GENDER EQUALITY

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ABSTRACT

Between 2014 and 2016, a pilot project was executed to promote energy efficiency through the NAMA housing retrofit. This project was carried out between the Mexican government and the German Cooperation for Sustainable Development (GIZ). in Mexico. The exercise served to propose specific approaches for certain groups of the population, by using energy efficiency to improve the conditions of Mexican families and showed the co-benefits that can be obtained from monitoring awareness and communication activities. on climate change and saving energy and water. The results of this pilot have served to verify that gender inequality in housing can be reduced by proposing affirmative actions to vulnerable groups by providing access to information and technical assistance for the improvement of their homes through energy efficiency.
Key words: sustainable housing, gender's perspective, climate change, social impact

This document talks about the lessons learned during the implementation of a pilot project planned to test energy efficiency for social housing in Mexico. It was evident during its execution, the necessity to get close to the population to achieve the goals of the project and the potential of these types of actions to reduce social inequality.

According to data from the National Council for the Evaluation of Social Development Policy (CONEVAL), the reconfiguration of Mexican households and the role of women reflects gradual changes for certain stereotypes, for example, in 2014, for every hundred households whose heads of family were men, 35 were headed by a woman, a situation that is growing and is relevant since it is directly related to women's participation in labour market and the difficulties they face in order to provide their households with material and human resources and to guarantee the subsistence of their families. It is important to notice that these households are more vulnerable, they have a greater number of members, greater needs, a greater number of dependent members and greater poverty conditions (Coneval, 2014).

The National Survey of Occupation and Employment (ENOE) said in 2016, 20.8 million women aged 15 years old and over were part of the economically active population. Of the employed women, 23.3% are self-employed, 2.3% are employers, 7.5% do not receive remuneration for their work, and 33.8% do not have work benefits (Coneval, 2012). Related to housing, 25% of Mexican households are headed by women, they receive a salary up to 30% lower than men and do not own their household papers, only 42% are owners; In addition, due to the conditions of access to economic activities and labour benefits, more than 50% of the houses are the result of their effort, built with their own resources, auto-constructed and without legal titles (María Elena Barrera, 2016). It is worth mentioning that of the 31.6 million households in the country, 8.9 million are in housing arrears (Conavi, 2016); These households have more difficulties obtaining adequate conditions such as energy and water. Currently, the residentialsector is responsible for 16.2% of the country's energy consumption and the production of 4.9% of all CO2 emissions (Fundación IDEA, 2013).

The Housing Law establishes in article 3:

"The provision of the Law must be applied under the principles of equity, social inclusion, so that any person, regardless of ethnic origin, age, gender, disability or economic and social condition, physical condition, religion, opinion or preferences can practice his constitutional right to acquire a home".

It is the State's obligation to provide the population with an affordable and dignified place where they can carry out their day-to-day activities (DOF, 2015). In addition, the National Development Plan 2012-2018 established gender's perspective as a transversal axis, so all government programs and institutions should promote equality between men and women (Inmujeres, 2013).

In order to comply with this mandate, the Government carried out actions related to reduce gender inequality by supporting women's formal access to land or providing access to loans for the construction or expansion of housing areas. These projects had the purpose to reduce home violence, for example the program "One more room" whose objectives were to offer spaces free of violence to girls and adolescents, to reduce urban gaps by improving the quality of life within cities and to contribute to the reduction of deprivation caused by the quality of housing space (Sedatu, 2016); However, policies should not only promote the reduction of overcrowding, but to consider cross-cutting actions that promote the possibility for women (particularly heads of households) to make decisions related to the condition of their homes and not available subjects for credits, to give them the opportunity to have access to programs to purchase and to improve their houses, so that they cannot only upgrade their lives in terms of space, but also to make them more comfortable and allow them to save money for other activities andthus reduce their poverty conditions.

In 2014 and until 2016, the German Cooperation for Sustainable Development (GIZ) in Mexico supported the National Housing Commission (Conavi) to develop the existing housing NAMA and to carry out a pilot project in the city of Mérida, Yucatán. The NAMAs are the National Appropriate Mitigation Actions and are voluntary activities whose purpose is to reduce greenhouse gas (GHG) emissions in developing countries. Mexico is the first country to carry out an action like this and this NAMA is the most developed in the world and received support from the German government for its design and implementation.

The objectives of the NAMA housing retrofit are to promote scalable energy efficiency standards, to support the government to create programs for the population to promote economic, social and environmental development through social housing (Passivhaus Institut, Izn Friedrichsdorf Gopa, 2014) and promote the energy rehabilitation of the existing housing stock.

The objectives of this pilot in general were:

- To propose cost-efficient measures for housing rehabilitation including energy efficiency
- To know the challenges of dealing with inhabited homes
- To establish communication processes with final users
- To evaluate the cost and benefit ratio of the proposed measures
- To provide practical information to the Mexican government

CONAVI, the National Institute for Housing for Workers (Infonavit), GIZ and the Trust for Energy Saving (FIDE), decided to execute it in the area called Polígono 108 in Merida, because it is a formal social housing development and there is a close relationship between the local Infonavit and the population.

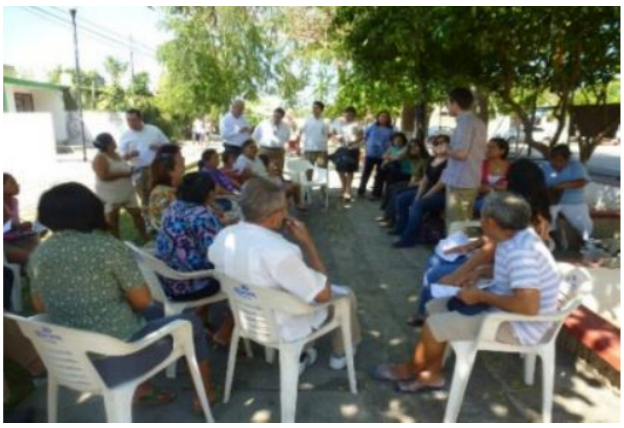

Image 1: Anahí RamírezOrtíz, GIZ First meeting with inhabitants of Polígono 108

To establish contact with the population of the neighbourhood, two workshops were planned for the inhabitants of the area, in addition to making house-to-house technical visits. These visits consisted of giving away information about the project, to invite the population to participate in the workshops in order to learn about climate change, what is energy efficiency and, to talk about the programs of the Mexican Government to promote housing. They also received specific information of the pilot project and the process used to choose the participants (Conavi, 2014).

There was not much information about the inhabitants or a clear idea of how their population should be approached, with the aim of achieving the goals of the project. The only certainty was the need to contact the people in a specific way, by using a simple and clear language so that the interests of the related institutions could be transmitted, and the objectives fulfilled.

It became evident the importance of being supported by the leaders of the neighbourhood to establish contact with its inhabitants; here, women are the leaders and through them the working team was able to bond with the others.Once the team (consisting of almost exclusively women) began to interact and to communicate with the population, it was possible to arouse the interest of the settlers and to count on their participation.

Image 2: Anahí Ramírez Ortíz, GIZ Working team during the first visit of the pilot Project for the NAMA housing retrofit

The fact that the leaders accompanied the working team at all time was part of the success because they influ-

Image 3: Anahí Ramírez Ortíz, GIZ First workshop for inhabitants of Polígono 108

enced in a positive way and improved the relations in the neighbourhood. The housewives felt confident, they were interested in learning about energy efficiency and a bond was established between all the inhabitants; A series of parallel activities to the awareness-raising workshops were carried out, for example, surveys were conducted to choose the dwellings to be intervened. The parameters considered to be part of the project were: houses with high energy consumption, without significant modifications to the original architecture, with a high number of inhabitants, who had the papers of their houses and have actively participated in the two workshops.

Once the contact with the people was established, the working team reformulated the role of the women, in order to encourage them to participate actively in all phases of the pilot; they attended most of the meetings, they sent information about their homes, they knew its conditions, their consumption of electricity, gas and water, they transmitted the information about the project to other members of their families and began to modify their habits inside their homes so they could save water and energy.

This contact was key to know how the population relates, and to consider the roles of men and women for the implementation of the project, for example, the schedules of the workshops and work visits were adapted to the climate and activities of the region, the information was elaborated considering their socioeconomic level and especially assured women did not have extra work from this project: It also emphasized their role to obtain benefits in their daily basis.

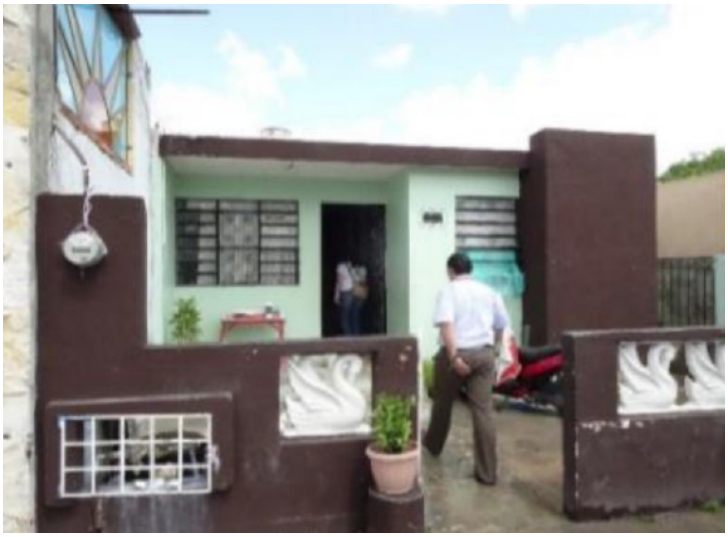

Image 4: Anahí Ramírez Ortiz Initiation of remodeling activities Visit to the site, Polígono

During the workshops, the population had basic information about the risks of natural disasters, the consequences of our way of consuming, and how to modify habits to consume fewer resources. They learnt how to improve the comfort of their homes. They were taught how to make a basic energy balance and solutions were shown to reduce their electricity consumption.

Students from Anáhuac Mayab University helped to carry out the physical and appliance surveys of the households interested in the pilot. This activity served them to practice how to make improvement proposals by using environmentally friendly technologies and materials. The students were impacted by the conditions of many of the houses and were sensitized on the role of construction professionals to improve the quality of life and to help people to reduce their vulnerability to change climate. After a year of the workshops, visits were made and the families commented the economic and comfort benefits they had, some commented their electricity bills decreased up to 50% during the summer.

The technical design of the NAMA housing retrofit proposes a “step by step” rehabilitation until reaching the optimum energy and environmental performance. This design proposes a baseline that consists of carrying out basic maintenance actions and once the houses are in good conditions, it proposes three steps to reduce energy consumption and to improve comfort; this to reduce the costs of rehabilitation and for users to immediately see the benefits and economic savings (Conavi 2014). The steps include the change of household appliances and modifications such as the installation of thermal insulation, high quality windows, cross ventilation and finally the use of renewable energy.

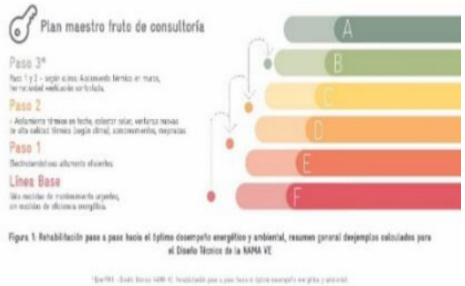

Image 7: GIZ Rehabilitation step by step refurbishment to achieve optimal energy and environmental performance,

Six improvement packages were proposed for the different types of housing including the steps of the NAMA. Due to time and budget, only two of them were used. The measures included the change of windows, the installation of shading and insulation for walls and ceilings, change of water saving equipment, and use of reflective paint.

Only nine houses were chosen to be modified. The families were asked to keep the electricity, water and gas bills in order to be used as a reference to know the behaviour of their homes. There was a specific follow-up for each participating family during the rehabilitation process and the first savings were the result of simple changes in habits inside their homes.

Image 5: Anahí Ramírez Ortíz NAMA Housing Retrofit Project, site visit, Polígono 108

The reform of the houses lasted almost six months and it was necessary for GIZ to accompany the inhabitants and the local construction workers in order to avoid misunderstandings between the masons and the users, to give confidence, to explain the constructive process and to eliminate any concern during the construction.

Image 6: Anahí Ramírez Ortíz Construction of ventilation for houses in Polígono 108

Although it was not possible to have specialized teams to monitor the impacts of the project, the population independently carried out measurements inside their homes and sent information to the GIZ; among the changes were that the temperature inside during the hottest seasons hovered around 8-12 degrees, which caused a decrease in the use of air conditioning (when they had it) and being able to change the destinations of their incomes. Once the work was completed, the GIZ team gave new training to the families about the use and maintenance of the homes, so that the interventions have an adequate duration.

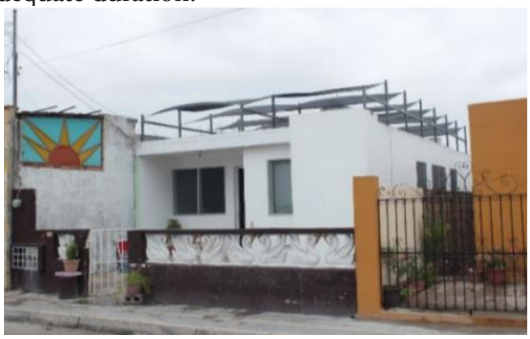

Image 9: Marco Casado Pilot Project, Polígono 108

In addition to the accompaniment, the pilot served to exemplify how training families helped to transform the way in which they interacted; members changed their consumption habits and changed their perception about climate change and the impact on their daily lives. Although each family had a different leadership, the participation of the women increased during the pilot. They felt more secure to give their opinion to other family members, to ask for advice from the working team about the type of interventions they could do in their homes and how to guide others to save energy. It was interesting to see how they taught their husbands, their children and grandchildren about energy efficiency and how to take care of the environment.They also changed the destinations of their savings, making energy efficiency a priority.

Many of the beneficiary population is self-employed and once they learned the benefits of rehabilitating their homes, they asked what other actions were feasible. Some of them used part of the money not spent on electricity

and water to expand some areas of their homes and even transmitted the information to others. The biggest impact of the project was thatthrough the dissemination of knowledge, mainly from mouth to mouth, a greater number of people in the neighbourhood and in the region rethought their ways of consuming and living.They learned that taking care of the environment it is something that benefits them, that not everything "green" is expensive, that having access to information is key when making decisions.Women mainly changed their role once they had the tools to educate their families differently and how giving their opinion made their homes more inclusive and equitable.

The experience of this pilot was key to elaborate technical and testimonial information in order to design communication procedures and information on the benefits of energy efficiency. For international cooperation programs, it helped to know from facts the importance to ensure the inclusion of gender's perspective as a transversal axis, especially for housing and rehabilitation programs in Mexico; In addition, another lesson learned was to understand that international financing must help to transform the population and that projects must fight to have among its objectives the empowerment of vulnerable groups, not only from the reduction of overcrowding and violence, but through education and training, recognizing that this type of projects are also an opportunity to comply with the Sustainable Development Goals (SDG) and other international commitments.

The activities of the project were used to develop awareness material for the Mexican government, it can be found on the portal www.micasaesmimundo.com A Strategy was developed to raise awareness on energy rehabilitation of housing with gender's perspective and GIZ will carry out a new project for the existing housing for the year 2019.

This exercise whose purpose initially was only energy efficiency, showed how sustainable development is a means of social transformation, because it positively influenced not only economic growth and protection of the environment, but also helped to eliminate social inequality. If the government aims to become sustainable, they must assure the participation of the population. Many urban problems can be reduced if the population is encouraged to change its habits. The role of Mexican households is key to transform the country and to trigger the social and economic changes necessary to achieve a more equal and more inclusive country.

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