

CIAV 2010 meeting, Finnskogen, Norway.

**INFLUENCE OF DEMOGRAPHIC MOVEMENT IN HOUSING QUALITY IN SAN ANDRES
AZUMIATLA, PUEBLA, MEXICO.**

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Abstract.

San Andrés Azumiatla is a town with 8 thousand inhabitants in the State of Puebla, Mexico. Although this town is only 12 Km away from Puebla city, the 4th largest city in the country, it is a very undeveloped town in terms of education, economy, social issues and health. Like in many non-developed communities in Mexico, people from San Andrés Azumiatla often emigrate to the US in order to find temporary jobs. On the other hand, most of the people who stay in San Andrés Azumiatla work in the city of Puebla. This fact added to poverty and a growing need for housing has led people to build their houses with many different construction materials, causing a lack of identity, health problems due to poor design, and a short period of life of these constructions. Nowadays, it is still possible to see vernacular housing architecture in San Andrés. The main aim of this paper is to present an analysis of the influence of demographic movement into the characteristics of new housing in comparison to vernacular housing. A research tool to be used on site has been developed for this purpose. During site visits all housing types will be registered under the following aspects: materials, construction system, typology, colours, orientation, functionality, ventilation and lighting strategies. Conclusions will determine whether vernacular or new housing construction in San Andrés Azumiatla responds to the needs of the inhabitants, and to which extend vernacular architecture has been lost due to the influence of people who are constantly going away and coming back to this town. This research is being developed by the Architecture Faculty and the Nursing Faculty of the University of Puebla.



Figures 1, 2. Houses in San Andrés Azumiatla (Mundo, 2009).

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Introduction.

San Andrés Azumiatlá is a town 12 Km away from the city of Puebla. Politically speaking, Azumiatlá is run under Puebla's government. This community is part of a classification called "Polígonos Hábitat"³ which means that this is a town with poor housing, lack of drinking water and drainage, and people with very low income (less than \$55 MX pesos/day = 3.4 Euros per day)⁴. In Azumiatlá live 8,837 people, from which 4,395 are men and 4,442 are women⁵. The main economic activity of people in San Andrés Azumiatlá is construction (46%), followed by agriculture (20%) (CECACVI, 2009). This explains the fact that all the houses in Azumiatlá are built by the people itself, the men of each family: fathers and sons.

Several social problems can be distinguished in Azumiatlá: health problems (mainly respiratory and stomach related diseases), low education, unemployment, migration (especially to Puebla city and some people to the US), low housing quality and public services. 40% of people in Azumiatlá live in houses with no floors, 47% live in 1 or 2 rooms houses for a family of 5-6 people, 85% have access to water, 71% burn their rubbish and 58% do not have toilets so they defecate in open areas (CECACVI-BUAP, 2009).

This project involves a study of 47 houses in sector 2 of Azumiatlá⁶. This sector has been chosen because is the area with higher population density and a variety of houses, and with more reliable data regarding people's health, activities and housing characteristics (Figure 3).

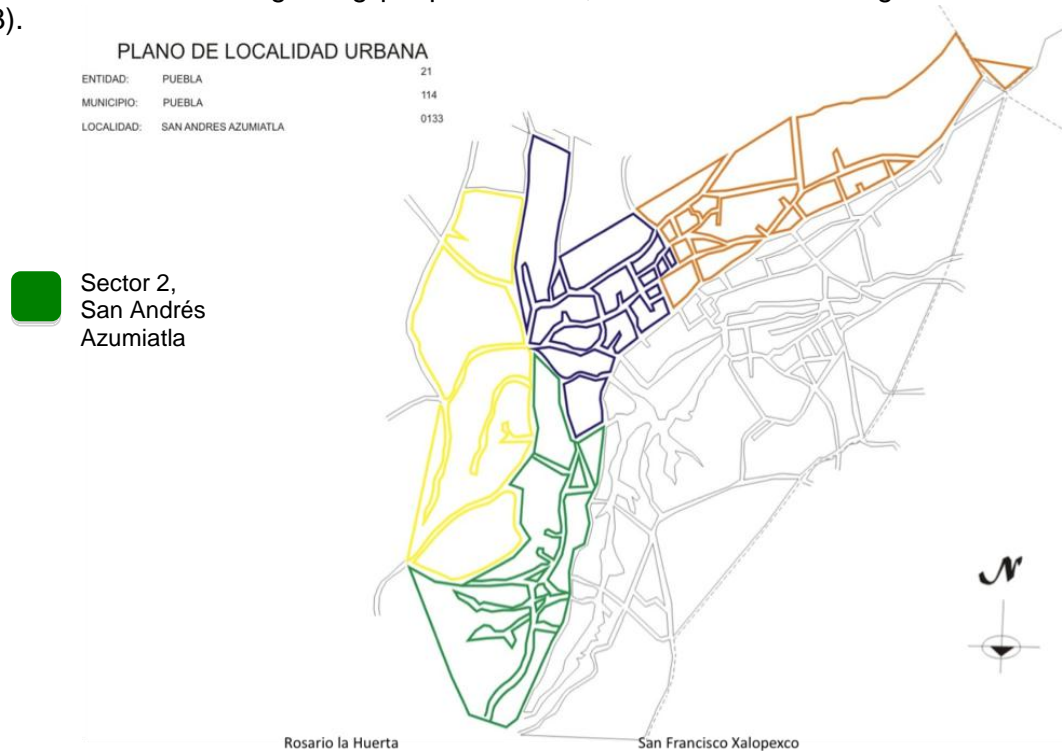


Figure 3. Map of the 4 sections defined by the CECACVI. San Andrés Azumiatlá, Puebla (CECACVI, 2009).

³ *Polígono Hábitat* is a territorial classification made to identify poverty according to inhabitants' income, housing, clothing and transport characteristics for each member of a family (CONEVAL, Mexico).

⁴ Ministry for Social Development, *Polígonos Hábitat*. Plan Municipal de Desarrollo 2008-2011, Ayuntamiento de Puebla, Available on: <http://www.pueblacapital.gob.mx/joomla/images/contraloria/pdf/Final.pdf> (last visit: 22nd Nov. 2008). p. 2:6.

⁵ Inegi, Censo de población y vivienda 2005. Available on: <http://galileo.inegi.gob.mx/CubexConnector/validaDatos.do?geograficaE=211140133> (last visit: 22nd Nov. 2008). According to the Nursing Faculty of the University of Puebla (CECACVI-BUAP) Azumiatlá has 7027 inhabitants (CECACVI, 2009).

⁶ For statistical analysis Azumiatlá has been divided into 4 sectors by the CECACVI (Community Health Center of the Nursing Faculty).

This paper intends to give a general idea of the different types of housing in Azumiatla focusing mainly on construction materials and environmental characteristics. Moreover, a general overview will be given regarding the influence of migration, mainly to Puebla, on Azumiatla's vernacular architecture.

Vernacular Architecture in Mexico: a loss of identity?

Mexico's diverse cultural, climatic and population characteristics have created a very rich vernacular architecture with many influences from Moorish architecture, Roman, Spanish, Pre-Hispanic constructions, etc. This architecture has been developed considering local materials, climate, as well as social and religious traditions.

It seems important to define the term 'Vernacular Architecture'. According to Schroeder (1998) Architecture, in a wide sense, means: the Art of Construction, referring mainly to habitable spaces derived from specific needs and a natural and built context. In addition, 'Vernacular' comes from the Latin word *Vernaculus*, which means domestic, native, from our home or country. The same author refers to a definition of Vernacular Architecture developed during the 1st International Seminar on Vernacular Architecture held in Mexico City in 1993 and organised by Infonavit and ICOMOS Mexico (Schroeder: 23):

"Vernacular architecture includes housing and other constructions built with the participation of the community and construction systems developed with the available resources, utilising technologies product of the collective knowledge and therefore, does not require qualified people to build it. Hence, the volumetric result, spatial relationships, colours and details identify the group of people who is producing it, here the user and the whole community must participate during the construction. This architecture could be secular or religious, rural or urban, temporary or permanent, but it has to be always closely related to its environmental, cultural, social and economic context; considering the needs, values, traditions and life style of the group producing it"⁷.



Figure 4 (Left). Vernacular house in Azumiatla. Figure 5 (right) Two storey new house in Azumiatla built with concrete bricks and steel (Polanco, Mundo, 2010).

Now, if we consider that vernacular architecture is part or product of the identity of a group of people, it is necessary to define the term Identity. Sosa (2010) has defined Identity according to three dimensions: the ethnic origin, a physical and geographical context and Idiosyncrasy as a product of social relationships that constitute a way of thinking and behaving, transforming the world with cultural and technical developments of a group of people. Hence,

⁷ Translation spanish-english by Julia Mundo-Hernández (2010).

the identity of a group is the product of human sensations and affections and not rational thoughts. The Identity then is subject to transformations and evolution. Since vernacular architecture is also the product of a group of people with certain origins and identity, is also subject to changes. Therefore, we cannot expect to see or build vernacular architecture identical to 100 years old vernacular architecture, for instance. Current cultural values, idiosyncrasy, natural and artificial context and cultural and technology developments must be distinguished in vernacular architecture.

Vernacular housing architecture in Azumiatlá has clearly evolved, from houses built 100 years ago by the great-grand parents of current occupants to new houses. Construction materials, roof materials, heights, windows size have all changed. The problem in Azumiatlá is that today houses are built by the town people but do not respond to the climate of Azumiatlá, to local construction materials and spatial distribution following people's traditions. Nowadays, most houses in Azumiatlá that belong to people with good income or those who receive money from their relatives in the US are very much like any house built in Puebla city or Mexico city. On the other hand, people with low income have very rudimentary houses that do not respond to the climate neither to people's needs or do not comply with comfort parameters regarding lighting, humidity, temperature and acoustics levels.

Migration and housing quality.

Migration to Puebla city, Mexico city and less often to the US, is common in Azumiatlá. Young men leave the town because they cannot find an economic activity that allows their families to live with dignity. Since Colonial times, around 1730⁸, native people of Azumiatlá have lost their lands to Hacienda's owners, which has caused a lack of adequate land and machinery to grow, harvest and sell products (La Jornada de Oriente, 2009). Until the mid 20th Century people in Azumiatlá used to produce and sell carbon out of trees from the forests that existed around the town. Today, there aren't almost any trees left and people live working mainly in the construction industry in Puebla.

The influence of the construction systems and materials used in Puebla city in Azumiatlá is evident. The problem lies on the general belief of people from Azumiatlá that those constructions are better than previous vernacular or traditional architecture in that community, they believe those houses are more permanent. The problem is that they do not realise that those houses are not comfortable in terms of temperature, ventilation, humidity and lighting (Mundo et al, 2010). Traditional architecture in this community were built with stone from a quarry about 2 Km away from Azumiatlá used in foundations and 30 cm wide walls, and wood roofs covered with red ceramic tiles. Windows, however, were always made very small in size due to people having not enough money to buy materials to close the windows with glass and steel, wood or aluminium structures, therefore, people often chose to have small windows or not windows at all⁹.

New constructions are made with low-density concrete bricks (walls), concrete floors, steel structures (as small columns and beams) and corrugated steel sheets as a roof. Low-density materials particularly corrugated steel sheets, together with poor natural ventilation produce overheating in houses, interior temperature is 2 degrees C higher than outside temperature. Lack of ventilation and bad sealing in windows and roof also produce high humidity inside Azumiatlá's houses, which is even greater than outside air humidity (Mundo et al, 2010).

⁸ Still a year ago in April 2009 there was a violent action between people from Azumiatlá defending their land, 500 policemen and 4 topography guys who were taking measurements in Azumiatlá's land in order to extend a motorway. Puga, J. "Se enfrentan policías y labriegos que retuvieron a 4 topógrafos en Puebla". La Jornada de Oriente, 26th April 2009. Available on:

<http://www.jornada.unam.mx/2009/04/26/index.php?section=estados&article=031n1est> (last visit: 30.03.10).

⁹ Information provided by Mr. Francisco Fuentes-Cordero, a 96 year old natural of San Andrés Azumiatlá. Interview held on 05.02.10 in Azumiatlá by the authors.



Figures 6, 7, 8. Different housing quality in San Andrés Azumiatla (Mundo, 2010).

Some people have no money to finish their houses, hence some constructions have the windows covered with paperboard or thick fabric because they do not have a window just the hole. This makes houses dark (around 35 lux when for carrying out simple tasks it is recommended at least an average of 100 lux) and cold during wintertime. Bad orientation also generates overheating and not enough daylight in people's homes.



Figures 9 and 10. Poor quality housing in Azumiatla (Mundo, 2009).



Figures 11 and 12. Housing influenced by the construction system used in the city (Mundo, 2009).



Figures 13 and 14. Vernacular architecture in San Andrés Azumiatla (Avila, Mundo, 2009).

Conclusions.

Housing construction in San Andrés Azumiatla is only one example of a town being influenced by migration to a city nearby. Unfortunately, in Mexico this scenario is quite common. Poverty, migration, poor education and a lack of interest from the authorities has resulted in a bad evolution of housing quality. Although it is being said that vernacular architecture changes with time according to many variables, in this town vernacular or popular architecture has changed for worst. Houses are built without considering the climate of Azumiatla, the views and natural context, the local materials and people's traditions.

The result is not only a non satisfactory architecture in terms of aesthetics, but more importantly, those houses are not comfortable regarding its environmental performance, functional distribution, size and type of spaces, which do not respond to families size and characteristics. The main goal of the first stage of this research is to develop design and construction recommendations for building new homes and renovating old ones in Azumiatla. This must take into consideration that the inhabitants of this community must be able to build their houses themselves; plus, housing design must consider also the identity of the people and their traditions so they can feel the need to improve their community.

Acknowledgements.

This research is sponsored by PROMEP-Mexico, Ministry of Education. Thanks must be given to the CECACVI, the president and *regidores* of San Andrés Azumiatla, and students with a scholarship from VIEP-BUAP.

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