Photo: Jacintha Castora Photography

# The construction sector of Puerto Ayora

Walter Jimbo[1] and Christophe Grenier[2,3]

[1]Universidad Andina Simón Bolivar, [2]Charles Darwin Foundation, [3]University of Nantes

This is the first study to examine the construction sector of Puerto Ayora. It provides basic information about a cross-cutting activity that impacts the economy, immigration, and urban landscapes of Galapagos. The construction sector is one of the most economically dynamic sectors. It utilizes workers, who in many cases are illegal residents, and is rapidly transforming the urban landscape of Puerto Ayora, the largest city of Galapagos.

This article is based on research carried out between September and December 2009, as part of the Geographic Footprint Project of the Charles Darwin Foundation. The methodology included the creation of a map of the construction status of every lot or property in Puerto Ayora (based on the municipal property register), and 125 surveys with individuals involved in the construction sector (50 owners of houses under construction, 50 construction workers, and 25 owners of construction companies or individuals/companies contracted to supervise construction).

The map developed for the study shows a total of 2761 lots (Figure 1). The status of each lot was designated as: a) completed construction; b) construction in progress, or c) empty lot. Completed constructions include those with finished exterior and interior walls (plastered or painted), as well as those that still have unfinished walls but are inhabited and where no construction workers are present. Lots designated as "construction in progress" include those where construction workers and/or materials were observed on the lot. "Empty lots" include all those with no construction as well as some with evidence of abandoned construction.

This analysis focuses on:

1) The feasibility of promoting "ecological houses," and

2) The business aspects of the construction sector.

## Ecological housing

Interviews asked residents what type of housing would have the least environmental impact in Galapagos and about the feasibility of promoting such construction. According to those surveyed, an "ecological" house is one that uses locally available materials and resources, renewable energy, and water recycling systems. In addition, ecological houses should have green areas with native flora.

Respondents generally believe that construction of this type of house would be more expensive than a traditional house in Galapagos. A person currently directing an ecological building project in the village of Bellavista responded that constructing a house with water recycling and solar power systems and material other than cinder blocks and cement costs at least 40% more than building a conventional home. Such costs would be beyond the means of many residents, especially those who build their


**Figure 1.** The construction situation in Puerto Ayora in October 2009, with 1871 properties with completed construction (yellow), 491 with construction underway (red), and 399 empty properties (green).

houses in stages determined by their own income flow. Another problem is that many landowners are building not only for themselves but also often for their relatives, or to have additional spaces to rent or establish a small business, all of which increases their basic costs.

For the most part, construction materials used in Galapagos are the same as those used on the continent: cinder blocks, iron rebar, cement, sand, and gravel. One variation in Galapagos is the use of volcanic rock extracted from the substrate at construction sites. This is often used to level the ground or to build small walls around the borders of a property. In some sites the use of illegally-harvested native wood was observed. In general, Galapagos construction does not reflect any particular consideration of environmental factors or the natural environment.

The study showed that most architectural designs used in Galapagos are not developed specifically for the insular environment. Building designs generally come from: a) generic plans offered by the municipality; b) styles associated with the owner's native city or town, or c) based on the family's income and cash flow (Table 1).

**Table 1.** How a customer selects their house plan.

| Method | No. |
|---|---|
| Plan from the municipality | 6 |
| Model common in native town/city | 6 |
| In accordance with immediate needs | 4 |
| Architect's plan | 4 |
| Model from other country/place | 2 |
| In accordance with material of the site | 1 |
| In accordance with commercial activity | 1 |
| Unknown | 2 |
| **Total** | **26** |

Source: Survey of property owners with current construction, September 2009.

Housing designs based on models from the continent require the use of similar building materials. In no case were Galapagos environmental considerations evident in the building plans. Plans offered by the municipality do not provide any options in terms of construction material, water storage, energy use, etc. A visit to "La Cascada" neighborhood of Puerto Ayora demonstrates the result of the broad use of plans offered by the municipality in early 2000, costing only $60 each (Photo 1).

The financial situation of a landowner's family plays an important role in influencing the construction process. Many of the newer neighborhoods in Galapagos appear similar to neighborhoods surrounding Quito or other cities on the continent, where houses are half built, walls have not been plastered, windows have not been fitted with glass or other materials, and construction projects have been abandoned. In these neighborhoods, landowners construct their houses in stages as they accumulate

**Photo 1.** La Cascada neighborhood in Puerto Ayora. Photo: W. Jimbo.

the money needed to continue. This makes it difficult to build "ecologically", which in addition to being more expensive requires pre-construction planning and investments.

## The economic dynamics of the construction sector

The second part of the analysis focused on the business side of the construction sector, involving workers, contractors, and distributors of construction materials. The actual number of construction workers is not known, but of those surveyed 13 arrived in Galapagos during 2009, five of whom were under age

Of the 50 workers surveyed, only two are originally from Galapagos. The others are immigrants, mostly from the highlands of Ecuador (Table 3). It appears that construction is dominated by immigrants from continental Ecuador who arrive to fill jobs not taken by Galapagos residents.

**Table 2.** Year of arrival in Galapagos of construction workers.

| Year | No. |
|---|---|
| Prior to 1990 | 3 |
| 1990 - 1998 | 7 |
| 1999 - 2008 | 25 |
| 2009 | 13 |
| NA | 2 |
| **Total** | **50** |

Source: Survey of construction workers, September 2009.

**Table 3.** Province of origin of construction workers.

| Province | No. |
|---|---|
| Chimborazo | 6 |
| El Oro | 2 |
| Esmeraldas | 1 |
| Guayas | 7 |
| Imbabura | 3 |
| Loja | 1 |
| Manabí | 1 |
| Galápagos | 2 |
| Pichincha | 1 |
| Tungurahua | 26 |
| **Total** | **50** |

Source: Survey of construction workers, September 2009.

The fact that the majority (28) of those surveyed are younger than 25 years old contributes further to the idea that construction contributes to immigration (Table 4). Prior to arriving in Galapagos, eleven of the construction workers surveyed were students (Table 5). Some suspended their studies to travel to Galapagos to work in construction. Others managed to stay and obtain their permanent residence in Galapagos and are continuing their studies in Santa Cruz.

**Table 4.** Age of construction workers.

| Age (years) | No. |
|---|---|
| < 18 | 5 |
| 18 - 20 | 15 |
| 21- 30 | 15 |
| 31- 40 | 10 |
| > 40 | 5 |
| **Total** | **50** |

Source: Survey of construction workers, September 2009.

**Table 5.** Previous occupation of the construction workers..

| Occupation | No. |
|---|---|
| Student | 11 |
| Artisan, business | 6 |
| Construction | 6 |
| Boat crew | 5 |
| Occupations related to construction | 4 |
| Dressmaker, shoemaker | 4 |
| Restaurant, cooking | 3 |
| Agriculture, fish culture | 3 |
| None | 1 |
| NA | 7 |
| **Total** | **50** |

Source: Survey of construction workers, September 2009.

To be legally contracted for work in Galapagos, a person must have permanent residence in the islands. However, any visitor may remain in Galapagos for up to three months and many individuals take advantage of this time to work illegally. This is fairly easy because employers generally care little about their employees' residency status (Table 6) and there is little risk for those who arrive as visitors and then work for three-months. Of the 13 recently-arrived construction workers, at least four plan to leave before the three month period is up; the others plan to stay as long as their irregular status is not discovered or as long as they have work.

**Table 6.** Requirements requested of construction workers by contractors.

| Requirements | No. |
|---|---|
| Knowledge | 6 |
| References | 1 |
| Permanent residence and other (experience, police record, title, etc.) | 6 |
| Work with others known to the employer | 1 |
| None | 3 |
| NA | 4 |
| **Total** | **21** |

Source: Survey of construction workers, September 2009.

A second group within the construction sector is comprised of contractors, architects, civil engineers, and construction supervisors who hire construction workers according to the number of projects they have. Only six of the 21 contractors surveyed indicated that they require workers to present proof of residency.

The 21 contractors surveyed accounted for an economic flow in Galapagos of US$2,663,200 in 2009 (three of the contractors accounted for 79% of this amount) and employed a total of 162 construction workers, in addition to plumbers, carpenters, and electricians. They reported that their profits varied between 10-15% of a given contract.

There are three large cement distributors involved in the construction sector. While it was very difficult to obtain data, two of the businesses are known to belong to the same owner. The distributors reported selling approximately 2000 quintals (each quintal contains 100 kg) per month. There are other businesses involved in construction, including one that sells paving stones produced in the island's quarry, located off the road to Baltra, where sand and gravel are extracted. These businesses are privately owned.

## Conclusion

Santa Cruz is comprised of two clearly-delineated areas: the national park and the urban and rural inhabited zones. Adequate construction alternatives have not been developed to lessen the impact of increased levels of construction on the island's natural environment and landscapes (Photo 2).

**Photo 2.** Destruction of the natural landscape in the last preserved neighborhood of Puerto Ayora, "Barrio Estrada": construction of a house and a hotel. Photo: C. Grenier.

This study shows that the construction sector involves various actors with personal interests and needs, and complex social interactions among landowners, contractors, migrant workers, and related businesses. Improving the current situation requires strict legislation and mechanisms that will require landowners to construct more environmentally-friendly houses, using more appropriate materials and improved systems for water management and energy.

Little can be done in terms of the existing construction in Puerto Ayora. However, environmentally friendly alternatives should be used for future urbanization projects such as "El Mirador." This new residential area, which is comprised of 1000 lots (total area of 630,000 $m^2$) would benefit greatly from a more ecological approach towards housing.

## Recommendations

Construction regulations are urgently needed in Galapagos and should be developed jointly by the GNP, local municipalities, and residents. Once regulations are in place, the government could require the use of alternative materials, such as lava rock or lumber from introduced tree species.

The construction of potable water and sewer systems are also urgently needed. The sewer system should not release waste water into the ocean, as this causes additional environmental problems.

Education campaigns are needed to create awareness among residents about the need for new architectural designs that could be considered "authentically galapagueño." Construction of housing that uses alternative energy should be promoted. In addition an evaluation of the possibility of creating a better system for collecting rainwater and for the reuse of waste water should be completed.

Construction workers should be required to form a local guild in order to better control the labor supply. The Chamber of Construction must work to regulate the sector and require designs and construction materials that have a lower impact on the environment.

Regulations and incentives should be extended beyond housing construction to avoid the construction of ecologically unfriendly buildings, such as the new bank and the five-story hotel on Baltra Avenue, both of which are completely inconsistent with the local environment.