



The Sustainable Development Pattern in Poor Areas: A Case Study of Las Gaviotas, Colombia

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Abstract. The eleventh target of Sustainable Development Goals (SDGs) is to build sustainable cities and communities. This requires a load of basic facilities and economic investment, which suggests that the implementation of the target will be extremely difficult for the area with poor financial conditions. Meanwhile, one of the patterns of the sustainable community is the 15-minute community, which is similar to the ancient Chinese traditional thoughts from Laozi. Therefore, by taking Las Gaviotas of Colombia as a case study and discovering the inspirations from the thoughts of ‘sparse people, small country’ from Laozi, this article focuses on the alternative sustainable development pattern that is more suitable for poor areas to develop sustainable communities, exploring the inspirations and limitations of this pattern. Results show that both the pattern and thoughts have their own limitations but there is still a lot that can be learned in terms of technology and so on.

Keywords: Sustainable development, Sustainable communities, Laozi’s thoughts, Small scale communities, SDGs.

1 Introduction

Among Sustainable Development Goals (SDGs), the eleventh one is to build sustainable cities and communities. However, there is no universal method now. Analysis reveals that challenges of development are typically first addressed in large cities, and similar severe inequalities, including urban infrastructure inequalities [1], scale inequalities [2], etc. between different regions and countries [3], often result in the spatial separation of rich and poor neighborhoods [2]. This indicates that some development patterns may not be suitable for cities with good financial conditions or villages with poor financial conditions [2]. This paper introduces current contradictions and situations, and it analyzes the inspirations from the thoughts of Laozi and if they can be completely applied to reality. In addition, the paper takes the concerning instance, Las Gaviotas, as a case study to obtain the inspirations, thoughts, and limitations. Finally, it discusses whether there are any solutions to solve these limitations. The main research method is a case study. This research picks a little-known instance to fill academic gaps in low-cost sustainable development and gives solutions to the limitations of this kind of development pattern.

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2 Background Information

2.1 Current Unequal Situations

Firstly, the author collected hundreds of sustainable theories, finding most of their presenters are Western people and they proposed these theories mostly based on the situation of Western countries, so these theories are likely to be unsuitable for other areas. This is theory inequality. Secondly, most of the developed countries are Western countries. They have a sufficient budget to develop sustainable facilities for national sustainable development. On the contrary, countries with poor economic conditions are unlikely to develop so-called sustainability. This is economic inequality. Thirdly, Western countries invest more in new technologies, and high technology can not only save them a lot of money, but they can also earn a lot of money by selling these technologies, as a result, intensifying economic inequality. This is technology inequality. These inequalities make the nation-standard methods unsuitable for all countries.

2.2 The Thought of ‘Sparse People, Small Country’ from Laozi

The essence of the thoughts of Laozi is ‘non-doing’, which means not doing anything intentionally. It asks people to obey the development laws of everything and try their best to not intervene in nature, find harmony with nature, give their respect to nature, and fit themselves into nature instead of changing it. Laozi once said that simple tools could be used to fulfill all the targets, so people do not need to explore more complex tools to enhance their work efficiency [4]. Simultaneously, the ideal country in Laozi’s mind is of a small scale, and there is no war in the country. People in the country know each other and there is no need for any police since no one will commit a crime, which means more people could get involved in manufacturing, thus saving a large number of labor forces [5,6]. The inspiration that Laozi gave people is: first, people should not change nature but change themselves to fit nature to protect it to achieve sustainability; second, people could live with simple tools instead of developing high technologies and polluting the environment; third, sustainable communities should have no wars, no guns, no police, and no crime. People can achieve self-organization. This will not only contribute to a stable community but also save a lot of resources. However, this pattern has its own limitations. For instance, many problems could not be solved by only one country. A national cooperation is needed. In other words, the thoughts from Laozi give people an ideal model that they can live a simple and peaceful life in a small country with sparse people [7,8], but this kind of pattern can not solve some complicated problems. So, completely changing that idea into reality is not reasonable.

3 Interventions Implemented in Las Gaviotas

Las Gaviotas is located in the parched grasslands of Eastern Colombia. Before the late 1960s, it was only a large area of barren plains, suffering the political wars between armies and guerrillas. At that time, an aristocratic Colombian development specialist

named Paolo Lugari took a road trip across these nearly uninhabited eastern plains, a region so remote and poor in soil quality that not even Colombia's historic upheavals of violence had taken root here. 'Instead of choosing an easy, fertile place to test energy self-sufficiency and creativity in agriculture, why not choose one of the hardest?' Lugari thought, deciding it was a perfect place to experiment with the future of civilization, so the project was done.

3.1 Energy Facilities

Las Gaviotas generates its energy with a load of renewable energy facilities, including solar panels and wind turbines. Simultaneously, solar kitchens are created, solar kettles are used to disinfect water, and water pumps are powered by children on a seesaw. People in the community also grow their own food and see a return of wildlife that has not inhabited the area for many generations. Also, they have windmills to generate power, and they even use cow dung to power their hospitals. Generally, they are making 100% of the energy they use renewable.

3.2 Cash Crop

In the late 1980s, Gaviotas suffered significant financial blows since the United Nations Development Program (UNDP) stopped funding and the Colombian Central Mortgage Bank stopped investing in social housing. So, it was an imminent task for local people to find a solution to deal with the crisis. The Caribbean Pine plantations emerged as the times required, which was recognized as a symbol of Gaviotas later. The Las Gaviotas government uses the resin produced by pines to make biofuel for all the machines and vehicles in Gaviotas, making the community become fuel self-sufficient. Besides, there is also a large amount of resin sold in the Colombian market since it is used extensively in manufacturing paints, varnishes, and other products. Colombian companies have been importing resin for decades and this will bring Gaviotas a load of revenue, solving its financial problems.

3.3 Local Medical Service

In the 1980s, there was a hospital built by local people to improve the general level of medical service. Technically, this hospital is powered by solar energy and animal dung without using any artificial energy, therefore, it is completely eco-friendly. Benefiting from the improvement in revenue, Gaviotas was also able to procure thousands of measles vaccines when a measles epidemic swept through Guahibo populations in the Llanos. The hospital was shut down due to the new policy banning private hospitals. Later, the Gaviotas government changed it into a factory producing resin.

3.4 Recycling and Reusing

The most impressive part of the project is that people in Gaviotas are trying their best to reuse instead of disposing of everything. There are several vivid examples. They design special two-cylinder steam engines to use the steam from the resin processing to generate electricity. Rather than emitting these fumes into the air, they use them again, achieving the goal of recycling use. What is more, they once created a Zeppelin to carry goods to get through the blockade of the war, but finally, they failed since the Zeppelin could not carry heavy goods. Later, they reused it to monitor wildfires across thousands of acres of forests. As can be seen, people in Gaviotas do well in recycling and reusing.

4 Analysis of the Gaviotas Pattern

4.1 Inventions with Low Costs

Due to a lack of finance, people in Gaviotas invented many technologies with high efficiency and low costs. These inventions can also be used in villages similar to Gaviotas, where a set of technological principles are created: technologies must be low-cost so countries that do not have financial resources can access them; technologies must be manually intensive enough to promote employment but still be competitive in the market; low-income populations must be able to access the technologies. In addition, Gaviotas people always refuse to patent their inventions so that they can be shared freely to help more people and thus improve collaborative development.

Many innovations created by Gaviotas people are extremely clever from the technical aspect, however, they are not successfully accepted socially. The pedal-powered cassava grinder can be taken as an example. Cassava is a common South American food. In Gaviotas, women are not allowed to ride on the pedal-powered cassava grinders since the bicycle seats are believed to be harmful to female genitalia, which means that this innovation may affect women's sense of self-esteem. Meanwhile, women complain that the grinder deprives the time they spend with their children, which means that the relationship between them and their children may be changed. All in all, although the pedal-powered cassava grinder is a complete success in the technical aspect, this innovation failed to be accepted by society, only intensifying the unfairness between males and females.

4.2 All-Age Involvement

The most amazing part of the project is that all the people in Gaviotas, regardless of old and young, are able to get involved in the project. Children could generate power by playing on the seesaw, and the old could share valuable experiences and previous stories to direct and encourage young people to do better in the project. So, no one is left out during the achievement of the project and this would bring everyone in the community a sense of achievement [9]. This project of all-age involvement brings a lot of changes to the land that seems unable to be used, and this inspires people that hard-

exploiting lands should not be abandoned. Instead, efforts should be made to wisely put them into use. Just as Lugari, the founder of Gaviotas, once said, the only deserts that exist in this world are deserts of the imagination.

5 Challenges of the Gaviotas Pattern and Possible Solutions

5.1 Current Challenges

As shown in Fig. 1, first, Gaviotas is losing its market. At present, China is rapidly taking up the market with cheaper resin from its western provinces. This makes resin prices keep decreasing, and Gaviotas people have to diversify their products and start selling bottled water from the clean aquifers under their forests. Second, this kind of development pattern is probably unrepeatable. Many countries all over the world including Thailand, Malaysia, Caribbean countries, and even China are trying hard to implement programs to replicate what Gaviotas did, but as Lugari once said: ‘It was impossible to replicate because Gaviotas is the antithesis of a government program, which is too linear; and it's more of a combination of random occurrences born out of chaos.’

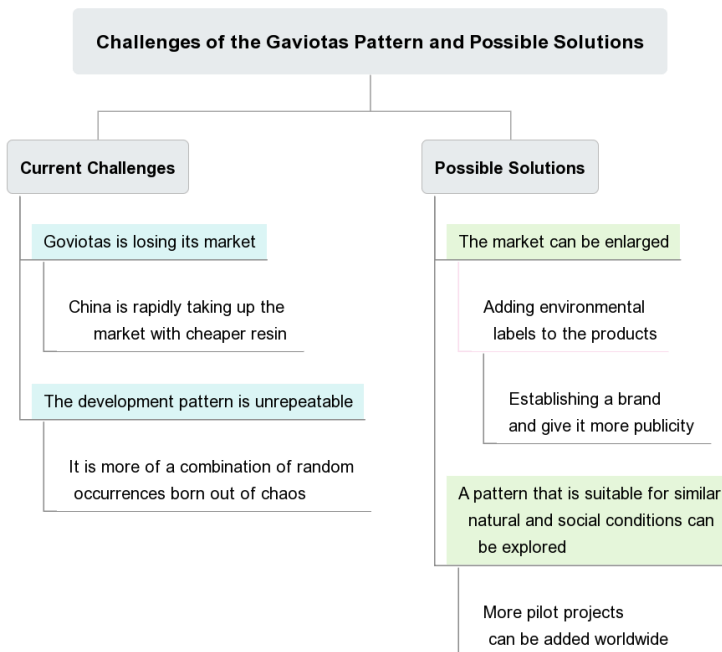


Fig. 1. Challenges of the Gaviotas pattern and possible solutions.

5.2 Possible Solutions

As shown in Fig. 1, first, the market can be enlarged. People in Gaviotas could add environmental labels to their products to enhance their competitiveness in the market. Simultaneously, they could establish a brand and give it more publicity, which will not only form the brand effect but also enhance its prestige, thus contributing to more sales. Second, more pilot projects can be added all over the world to accumulate experience. Now, the development pattern is not mature enough, and there are still a lot of trials and errors to make before it can be used on a large scale. Therefore, more pilot projects should be processed in different places all over the world in different natural and social conditions, so as to draw lessons and explore a pattern that is suitable for similar natural and social conditions.

6 Conclusion

To conclude, the project of Las Gaviotas is a good instance for people to better understand how sustainable communities can be built with low financial expenses and all-age involvement. However, a combination of random occurrences contributes to the success of the project, which suggests that the pattern of Gaviotas is almost impossible to replicate completely. Nevertheless, people can still learn a lot from this project in terms of technology, ideas, experiences, etc. In a word, not every part of the project can be learned but its pattern of sustainable development is worth to be studied and combined with local conditions to develop a more suitable pattern. In this case, future studies can focus on a comparative analysis of more cases from various countries with different natural and social conditions to discuss sustainable development patterns that can be applied on a large scale.

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