



GCI/Namlo Nicaragua “OrganiCasa” Greenhouse Program



Building Community Resilience – 2016 Report

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The purpose of our project has been to improve nutrition and incomes in eight poor, rural and remote communities in Nicaragua through the dissemination of low-cost greenhouses. The greenhouses cost 80% less than anything in the market, are durable and produced locally. The greenhouses have been proven to help families produce organic vegetables – many for the first time - giving them access to economic opportunity in a growing organics market, improving food security and building community resilience.

Categorized as a low-income, food-deficit nation, Nicaragua is the second poorest country in the western hemisphere. About 46% of Nicaragua's children suffer from



Bismark Rodriguez & family El Quebracho

chronic malnourishment (PCI 2012) and many of these children live in rural communities, like the ones we serve. The World Health Organization reports that over 20 percent of children under five years of age still suffer from stunting. In 2016, it was GCI/Namlo's aim to help **50 families acquire a greenhouse**, and to **continue to train 26 families** who acquired their own greenhouse in previous years (2014-15). Our tasks were to provide training in organics, conduct nutrition education, build market linkages, and measure the productivity of families to create a model for replication and expansion



Greenhouse owners Pedro Machado & Family

throughout Nicaragua. We envisioned that in 2016, 76 families would produce \$39,500 worth of organic produce, and all would include vegetables in their daily diet. Participants would increase incomes between **20 and 40 percent**. In partnership with the National Autonomous University of Nicaragua, we planned to conduct nutrition outreach and training as well as create baselines for measuring impact on each family's nutritional status and change in diet. One of the

outcomes of this 12-month project was to create a model and sustainability plan for expanding the dissemination of greenhouses throughout Nicaragua.

Background & Surveys

In 2014 GCI/Namlo initiated the [Esteli Livelihoods Survey](#), as well the [Nicaragua Nutrition Survey 2015](#) conducted by GCI/Namlo International in cooperation with the National Autonomous University of Nicaragua (UNAN), where it was evident that the lack of food security suffered by the majority of rural Nicaraguans is causing widespread undernourishment and is caused by a lack of dietary diversity and an average monthly income which is well below the poverty line. 66% of those surveyed earn less than the average minimum wage for the agriculture sector (\$120/month), which is already 30% lower than the national minimum wage (\$180/month). As documented in GCI/Namlo's Nutrition survey, food insecurity is widespread and further compounds the problems experience by rural

families. A large portion of the population ages 1-5 are at risk of stunting due to a lack of micronutrients and malnutrition. For the adult population obesity is a major concern and puts them at risk of contracting many non-communicable diseases, such as chronic heart disease and diabetes. From these reports GCI/Namlo developed a plan illustrated in its [Greenhouse Project Logframe for 2016](#), as well as [projected outcomes](#)

Impact To Date:

Data collected from OrganiCasa owners documented in the [Cumulative Greenhouse Production Report for 2016](#) show us that **the introduction of low-cost greenhouses in these areas is improving agricultural production and dietary diversity**, in a manner that is immediate and offering long-term solutions to poor nutrition. The greenhouses are also **generating revenue to measurably improve incomes** with the average of a 20% increase to annual incomes. In 2016, Thirty-



Paula De Socorro - El Porvenir

four families were added to the existing twenty-six families already using the OrganiCasa as of December 2015 bringing the total number of families to **60 (+-250 people)** with out of a target of 76. **20% of greenhouse sales were to women.** Demand for the greenhouse is outstripping supply, logistical and staffing resources. However, GCI/Namlo response to demand has brought it to a **total of 18 communities**, exceeding our target.

Greenhouse demand has grown by word-of-mouth, and installations since the inception of the program is as follows:

2014	6 installed	Barrio Nuevo (2), Los Pinares (2), El Salmeron (2)
2015	20 installed	La Labranza (1), Las Calabazas (5), Los Llanos (1), Barrio Nuevo (4) La Garnacha (2) La Balestrera (1), Portrerillo (6)
2016	34 installed	Sabana Larga (1), El Porvenir (2), Los Horcones (3), Rio Abajo (3), El Barro (3), El Quebracho (5), Las Calabazas (2), La Tunosa (2), Rio Grande (2), El Quebracho Madriz (2), La Chacara (1), Achuapa (1), Los Llanos (1), Insfop (2), La Garnacha (4), El Soncuan (1)

During 2016, **67,253 lbs.** of vegetables have been produced at a total value of over **\$11,554** (target 39,500) for an average of **1,564 lbs. produced per person** with a value of **\$275 per person**. What's important to note is that these figures only represent **forty-five** of the current families, due to the fact that 12 new families have not been generating data from harvests by the end of the year. Three months are necessary for the first crops to be harvest and the twelve families that received their OrganiCasa in the months of October, November and December have not yet reported their production.

One farmer in Las Calabazas **earned over \$8,500** in a three-month period by growing and transplanting **13,000 green pepper seedlings**, to irrigated fields, which resulted in a harvest of 60,000 lbs. Leaving aside his success, since the start of the project, the average family has harvested 186 lbs., consumed 105 lbs. and sold 82 lbs. worth. With our initial goal being to improve the dietary diversity of families, we are pleased to see that families are eating the majority of the vegetables, and selling afterward.

A healthy indicator of the acceptability of the OrganiCasa greenhouse has been the continuous demand as evidenced by a **waiting list of 20 – 40 families** on an ongoing basis.

GCI/Namlo experienced a healthy achievement of our “stretch” targets, despite funding shortfalls with an already modest budget. Limited funds prevented us from engaging in a couple of key activities, namely **actively linking family production to higher-value organics markets** as well as conducting **nutrition education and measurement**. Installations were postponed during the months of January, February and March of 2016 due to the need for more intensive field training for both GCI/Namlo staff and recent greenhouse owners. In 2016 we saw over an increase (34 installations) as compared with 2014 (6 installations) without an increase in personnel or funding for personnel. Four installations are the max number of installations that can be performed with the current available field staff (3) and vehicles (1).

GCI/Namlo’s field expenses totaled less than \$50,000 (\$48,420). GCI/Namlo raised a total of \$70,243 – more than a quarter of this received retro-actively - (out a target of \$82,000) to implement the program, which included the salary of the part-time U.S. based director of the Nicaragua activities.



This bare-bones approach has its limitations: in cooperation with the UNAN, we designed a plan for on-going nutritional education, however, due to lack of funding we have not been able to hire the individual who is proposed to implement the nutritional education program. Nevertheless, our staff continues to

communicate the message of dietary diversity as an important part of the Greenhouse Program and discusses various uses of the variety of nutritious vegetables we continue to promote.

Because our staff meets with the families on a face-to-face basis, they are able to follow up with the families on the evolution of their diet. Our staff has worked with some of the farmers in the areas closer to the city centers of Estelí and Managua to better develop connections to

the local markets but in order to develop better linkages for those further removed from the local markets will require an increase in staff personnel, funding for those individuals activities as well as the **hire of a vehicle for transporting goods to market.**

Factors that Are Contributing to Project Impact:

In addition to a more affordable product and installations, our field staff provides **starter seed packages, organics workshops and agriculture training** (soil preparation, composting, bio-pesticides & bio-fertilizers) to each of the families. Organics workshops, agriculture training and technical assistance were provided to each of the 36 new constituents in 2016 both prior to and during installation and during follow up visits. Each family was visited one month prior to the installation to ensure that the **soil had been properly prepared** and



Trainer Don Vicente Arauz assisting

the raised beds had the proper height and spacing. Each month, GCI/Namlo's three staff visits all 18 communities and families, providing continuous problem solving, technical assistance and training.

Multiple factors are responsible for the success of the project, the most important being the proper identification and fulfillment of a

need in the market for the greenhouse. The primary factor for the widespread acceptance of the OrganiCasa is that fulfills a need at a reasonable price (**80% less expensive than the closest available product in the market**) and there are no other similarly priced products in the market to compete with it. Small hold farmers in Nicaragua have historically had limited access to covered agriculture techniques like greenhouses due to the prohibitive expense of them. However, vegetable production is steadily moving entirely towards

covered production due to the increased resistance developed by insects due to the widespread use of pesticides.

Another factor in the uptake of the program is the growing interest in organic vegetables that is taking place throughout Nicaragua. Esteli now has a market day for organics, and the price of organic seedlings, seeds and vegetables is higher than others.

The design of the OrganiCasa was intended to meet the needs of small hold farmers in Nicaragua at an accessible cost. As a result, the OrganiCasa was



Oscar Bustillo and his kids

the first design on the market that took both the economic limitations of the small hold farmer and the problem of crop protection into account before developing the product. Additional factors that contribute to the proven impacts are the longevity of the project, the experience of the staff, the workshops and technical assistance provided to the farmers and the regular field visits made by GCI/Namlo staff.

While GCI/Namlo's involvement has ramped up the Greenhouse project starting in 2014, GCI/Namlo's partner organization, Global Community Innovations (GCI) started developing the OrganiCasa in 2007. The lessons learned by GCI between 2007 and 2014 enabled to GCI/Namlo to capitalize on that foundation and focus on fine tuning the program rather than going through the growing pains already experienced by GCI. GCI/Namlo's staff consists of the same individuals who have worked with GCI since 2007. As a result, their experience with the Greenhouse program has made for a fluid transition to the more intensive approach taken by GCI/Namlo to more widely disseminate the OrganiCasa.

Potential for Scaling

The materials necessary for production are PVC and the mesh cover



Preparing the soil prior to Installation

known as "malla anti-virus." PVC is available in just about any corner of the world and the malla anti-virus is quickly becoming readily available through Central and South America and is also being produced in China. The manufacturing of the OrganiCasa is very simple and requires only an industrial sewing machine and heavy weight nylon thread. The current manufacturing facility

is a 500 sq. mt space in a residential neighborhood in Managua and our fabricator is a shoe repair person. Thus, the technology needs for the production are very low and can be replicated anywhere the previous mentioned materials are available and the basic equipment and skills exist. In terms of the use of them in the field, climate does affect the efficacy of and the need for the OrganiCasa. While Nicaragua is a tropical climate, the area where we have had our success is limited to the more arid mountain regions that are more semi-tropical than tropical. However, most agricultural production in Central and South America takes place in similar climates, and the OrganiCasa has been installed and used successfully in the western portion of Honduras outside the town of Copan Ruinas near the Guatemalan border.

Currently, we have a waiting list of twenty-seven families to receive one of the two OrganiCasa designs. That list fluctuates regularly and has reached as high as forty-two families. We expect that to continue to grow as the number of communities involved grows. We tend to receive interest from at least one new community every 2-3 months.

Micro-credit plays an important role in the success and the replication of the project. On average, most farmers are able to pay off their investment in the first two years both through the sale of produce grown in the market and the savings they receive by spending less on purchasing food. To date we have loaned the equivalent of **\$9,200** in product and **\$2,923 has been repaid**. That constitutes a 32% repayment in two and half years. However, thirty-eight of the total sixty families that own OrganiCasa greenhouses purchased them between April and December of 2016. Based on the averages, we should see that repayment increase substantially next year, as those payments are made quarterly. Because Nicaragua is the poorest and least economically developed country in Latin America one would expect that the results in more economically developed countries would be even better.

GCI/Namlo has succeeded in establishing some basic foundations for sustainability including a) **developing an affordable product** that produces measurable benefits to customers via market demand for vegetables b) **a growing word-of-mouth demand for the product** c) a **delivery mechanism and supply chain** and d) a **training and technical assistance** package. The challenge for GCI/Namlo for scalability and sustainability is to a) determine the min/max of technical assistance needed to ensure the success of users b) increasing the repayment rate of families to ensure a steady and increasing funding stream for operations c) offering microcredit resources to families d) to support item b), establish market linkages for users to increase their net profit (and pay off their loans faster)



and e) to initiate nutrition programs that can not only improve the diets of users, but will document nutritional impact as well as to promote the greenhouse program.

Currently, despite the continuous demand for the greenhouse, our resources (three staff and one vehicle) have reached the carrying

capacity of the program at around 50 new users per year. If we can continue to increase the income of the users, accelerate the payment of the greenhouse loans, and build our resources in the field, we believe the program will be 90% self-sustaining in four more years.

Sustainable by the Community



[Planting in Marlene Videia's Greenhouse](#)

The OrganiCasa greenhouse has a long life-span, with prototype models installed in 2007 still being used today. Once the OrganiCasa greenhouse has been installed and the GCI/Namlo staff has assisted in helping OrganiCasa owners refine their skills in organic horticulture production no further involvement by GCI/Namlo International is

necessary for producers to continue to reap the nutritional and economic benefits of the project for 7 years at least (conservative estimate of the lifespan of the greenhouse).

With the supply chain in place, further demand for the OrganiCasa can be fulfilled through the existing manufacturers and installers. The growing demand for the OrganiCasa shows us that there is a real market for the product. No formal marketing of the product has been done with the exception of meeting in 2014 with four communities where GCI/Namlo has historically worked on education projects. Since then, all solicitations of the product have come through word of mouth and have encompassed 14 new communities scattered over one hundred and fifty miles.

During our field visits, we surveyed farmers who had been successful with the OrganiCasa, whether they are considering purchasing and additional one. The most common response was they would be

interested in a larger one. As a result, we established a prototype in September of 2016 that was twice the size of the original OrganiCasa. That prototype is now in production and has already received nine solicitations from farmers despite its higher cost.

Collaboration & Connections

The overwhelming acceptance of the OrganiCasa by small hold farmers in the regions of Estelí, Madriz and Condega have created a waiting list that has never dropped below 25 and has, at times exceeded 40. As the demand for the OrganiCasa has increase we have slowly raised the price over the last 2.5 years incrementally from its original introductory price of \$125, which carried a 50% subsidy, to the actual production cost of \$250. While there is very little overhead covered at this cost, it has reduced the capital necessary to produce more greenhouses since the income has increased as the price paid for each OrganiCasa has risen. Additionally, we have developed a larger version of the original OrganiCasa (OrganiCasa XL) and have priced it to include a small margin of profit. The demand for the OrganiCasa XL was much greater than expected and several of the farmers on the waiting list opted to purchase the larger model despite the higher cost and the larger deposit required because of their confidence in recouping their investment through it.

In terms of external funding, we have received grants from the Light a Single Candle Foundation, the Disaster Relief International Foundation, the Clifbar Family Foundation, the International Foundation and a grant from the Benito and Frances C. Gaguine Foundation. We have also found interested partners through International Development Enterprises (IDE), which has been working in the sector of "covered agriculture" in Nicaragua, with their staff expressing interest in using the OrganiCasa over the larger, more expensive models, currently in use in other locations.

Bio-Nica, a local NGO in Nicaragua working in small-scale and home garden production, is another organization with which we have been involved. We attended several of their workshops on bio-intensive farming and have implemented some of their techniques in our own projects. This year Bio-Nica has requested that we installed the OrganiCasa XL at their demonstration farm. We have developed a relationship with the Dept. of Nutrition at the **UNAN (National Autonomous University of Nicaragua)** in Managua and are working to develop nutrition workshops with the communities where the OrganiCasa project has been implemented.



Bio-fertilizer & composting workshop

We believe this project is ripe for potential opportunities for collaboration, and we've just barely scratched the surface. There are opportunities to team up with other non-profits to promote and disseminate the product, there are opportunities for linking microfinance organizations with rural families, and there are opportunities to partner with universities to better track the agronomic performance of the greenhouse. Likewise, building the linkages between producers and consumers could be facilitated directly by GCI/Namlo, farmers' cooperatives or in conjunction with private sector partners.

We believe that the program has succeeded in the "proof of concept" phase in that we have produced a product that is more affordable to rural families in comparison to what is in the market, and that the OrganiCasa does have measurable impact on dietary diversity and incomes. Our challenge for the future is to scale up the project to reach more families and increase the cost recovery. In addition to



Elsa Alvarez's greenhouse in El Salmeron

just developed.

There are many potential tie-ins with this project, including using it as an entry point for more broad-based community development, linking with schools, women's groups, strengthening or establishing agricultural cooperatives, establishing peer-to-peer "master gardener" programs, linking with health education initiatives of other organizations and government institutions. The recent emergence of "copy cat" greenhouses is a challenging but interesting verification of the efficacy of the greenhouse and potential market demand, which resulted in our branding of the "OrganiCasa" to ensure quality for potential customers. It is important to remember that we need to ensure the success of the families investing in the greenhouse, and this can only be accomplished by the tireless work of our field staff who provide the installation, training and ongoing monitoring and problem-solving with customers. The OrganiCasa can work as a stand-alone product and even be used for non-organic vegetable production. As the demand for organic vegetables grows in Nicaragua, it will be equally important to certify our producers and to document the training techniques we are using with them, so that they are able to receive the best possible price for their surplus vegetables.

this, we need to increase our measuring of the impact, initiate the nutrition education and outreach, and build the market linkages that can increase the incomes resulting from the sale of surplus vegetables.

Customer segmentation is also an area to work on since there are many potential buyers that are financially better off than those in our existing communities, who are also interested in

purchasing the larger, more expensive model