Development Capstone

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When considering economic development in Nicaragua, understanding its current conditions and their policy implications is crucial. The full scope of the present cannot be understood without a proper historical perspective. Development, of course, is indicated through a variety of interlinked components, from social capital to global integration and from infrastructure to investment. Effective policies are complementary, address a variety of related indicators, and take into account the social, cultural and economic stage on which they're set. At all times, the three crucial factors of development should be kept in mind: education, health and income; as well as sustainability.

Therefore, to recommend policies for Nicaragua, the first step is to take a look at Nicaragua's stage of development, and identify its current strengths and areas of policy focus. Nicaragua has quite a few positive development indicators. According to data from the U.N., as of 2014, Nicaragua has a pretty high life expectancy: 78 for women and 71 for men; as opposed to 86.5/80 in Japan and 81.3/76.5 in the U.S. Nicaragua's fertility rate is quite low at only 2.3 births per woman, just above the replacement rate of 2.1 births per women. GDP growth is fairly strong at 4.7%. Indicators on gender equality are also positive; for example, women accounted for 41% of the seats held in national parliaments as of 2016.

On the other hand, 32% of employed work in the agricultural sector as of 2010, an increase from 2005. Considering that development generally charts a path from rural to urban, agricultural production to industrial production, this is cause for concern. Investment and technological progress paints a similar picture. In 2012, there was only 1 resident patent filing per 1 million

people. It seems national health could also be improved: current expenditure accounted for only 9% of GDP in 2014.

The second step is to look backwards through Nicaragua's history to understand the impact it has had on the country's development and culture. The revolution in Nicaragua had an enormous impact on its infrastructure and future. Collier describes civil wars as "development in reverse" and points out that they destroy infrastructure, increase crime and poverty, and have a devastating impact on quality of life within the warzone (2003). The fighting in Nicaragua caused an economic crisis, "a sharp decline in agricultural and industrial production", "high levels of unemployment, inflation, defense spending, and capital flight" and also increased government debt (Merrill, 1998, pg. 36). Nicaragua's GDP per capita was halved during this period (Collier, 2003).

These statistics and more depict Nicaragua as a country with fairly high GDP growth - but one which cannot be expected to continue without significant gains in savings and investment. Its high levels of inequality and continuing numbers of people living in poverty are also areas of necessary focus. Health, education, and related infrastructure are, as always, a productive means of improving Nicaragua's economy. The most productive policies will therefore focus on poverty, savings and investment, underscored by education, health and a growing financial market.

One of the most important components of human development is education. A poor education system can be tied to numerous problems concerning the development of a country such as low savings and health issues, and higher levels of poverty in general. According to Unicef's statistics, Nicaragua currently has a net primary school enrollment rate of 93.9%. This may seem

decent, but compare to South Korea, a country which has an impressive development story and an enrollment rate of 99%. In other standards, such as adult literacy, Nicaragua is also behind highly developed nations. Continuing with South Korea as a comparison, the adult literacy rate in South Korea, defined as the those over age 15 who are able to read and write, is 97.9% of the total population, compared to Nicaragua's 82.8% of the total population (The World Factbook, 2017). These statistics are few that make it clear Nicaragua is behind in education, and the development implications of this are necessary to discuss.

Education is important to consider in developments because of its many spillover effects which have positive impacts on many other areas of human development. The importance and specific impacts of education on other areas of life have not only been considered but also studied by many. The idea that education is a successful strategy to reduce poverty gained popularity after it was noted that the East Asian Tigers (e.g. South Korea, Taiwan, China, and Singapore) were making tremendous development strides largely because of their investment in education and human capital.

One paper published in the International Journal of Academic Research titled, "The Impact of Education on Poverty Reduction" discusses the indirect impacts of education on human development that have been found since this idea really took root as found by a study done in Pakistan. It begins by bringing up that the Millennium Development Goals (MDG's) of the United Nations and World Bank both recommend primary education improvement in developing countries due to primary education bringing in the highest returns to living standards as compared to secondary or tertiary education. The paper also notes that it is important to take note of the mutually reinforcing relationship between education poverty and income poverty, that is,

that they are incredibly interdependent and hard to improve separately. Still, this study, done in Pakistan, found and proved that our ideas about the effects of education on poverty are correct. By running a logistic regression model on the "probability of being poor" on experience and education levels, it was found that more education correlated with a decrease in the probability of being poor as expected (Awan, Masood Sarwar, et al., 2011).

Other studies considering the effect of education on important human development indicators are health and savings. Studies have also found strong positive links between these variables as well. In a study done by the World Bank on the link between education and savings, data from 74 countries over the years 1960-1990 was collected and economists found that in the long run, education positively influences savings. According to the paper, every percentage point increase in education stock increases savings by 0.37%. Notably, the best returns to education seen in the form of increase in savings in Latin America is from primary and secondary education. In this region, tertiary education holds much less benefit than is seen in non-developing countries (Morisset, J., & Revoredo, C., 1995).

In regards to educational benefits on health, a clear positive relationship is seen here as well. A paper for the National Bureau of Economic Research titled, "Education and Health: Evaluating Theories and Evidence", found that there are overall great returns to education in the form of health, for example, they found that an additional 4 years of education was correlated to a 1.8 percentage point decrease in 5-year mortality relative to an 11-percentage point base (Cutler, D. M., & Lleras-Muney, A., 2006). The authors go on to discuss possible reasoning behind the link between education and health such as having better jobs in the labor market and potentially

better insurance, a greater value placed on the future, etc., but overall the conclusion is clear. Education plays a clear role in population health as well as savings.

Poverty is inextricably linked to health and education, as well as inequality. Both poverty and inequality are related to low levels of savings, as people cannot save if they must consume the entire worth of their income. Eventually, all of these factors link back to investment, quality of life, and overall development. However, education and poverty are rewarding places to start, and factors that can be addressed by a single program - or, that is to say, a single program can begin to address these problems.

One such program is conditional cash transfers (CCTS), which has proven to reduce both poverty and inequality. These CCTs are shown to have a direct impact on health, education and, of course, poverty, as they do immediately increase income. According to Fizbein (2009), "[t]he [World Bank] report thus argues that CCTs have been an effective way to redistribute income to the poor," (p. 2) and we can continue to expect them to be. Their conditional nature also enhances their effectiveness, and they tend to be better than other types of subsidies or goods transfers.

CCTs are more effective than other types of subsidies or direct goods transfers for a number of reasons. Direct goods transfers can crowd out the demand that local businesses depend on, thereby crushing the local economy that they intended to support. Additionally, subsidies and goods may not account for what families actually need. For example, a budget for pencils designed to support children in going to school could ignore the fact that they actually need to pay for transportation fees.

On the other hand, these programs are generally conditional for a couple of reasons. One is that they are more popular among the general voter base. Another is that these conditions make them more effective in achieving development goals. Generally speaking, there are conditions for health and nutrition, such as "periodic checkups, growth monitoring, and vaccinations for children less than 5 years of age; perinatal care for mothers and attendance by mothers at periodic health information talks," (Fiszbein, 2009, p. 1) and educational conditions such as school enrollment and "attendance on 80–85 percent of school days" (Fiszbein, 2009, p. 1).

Culturally and economically, Latin American countries have a lot of similarities to one another. Therefore, programs that worked well in some Latin American countries may have a better chance of working well in Nicaragua. CCTS are among such programs. In fact, "[v]irtually every country in Latin America has such a program" (Fiszbein, 2009, p. 1).

Although Nicaragua does not currently have a CCTS program, it was tried from 2000-2006: a program called Red de Protección Social, abbreviated RPS, and followed up with a study to determine long-term efficacy. This is particularly important to weigh the costs and benefits of such a program, since "…the high cost of providing cash transfers to families, when compared to other programs increasing short-term enrollment [makes] CCT programs…appear relatively expensive" (Barham, 2013). Therefore, long-term gains would make CCTs much more appealing.

The Poverty Action Lab study demonstrated a positive long-term yield from RPS in addition to the well-known short-term yield from conditional cash transfers. RPS delivered cash transfers to female head of households once every other month: a food stipend was given to every family in

the program; an educational stipend to those with a child between seven and thirteen years of age.

The evaluative study focused on boys between nine and twelve, comparing those that received the educational stipends and those that did not. It found that those who received the educational stipends "still had nearly half a year more schooling… [and] …saw an average improvement of approximately a quarter of a standard deviation on standardized tests in math (speed and problem solving) and Spanish (reading and spelling)" (Barham, 2013). These are significant long-term gains, and support the overall efficacy and value of the program.

Therefore, we can conclude that a conditional cash transfer is a useful policy in the continuing development of Nicaragua. It can be expected to improve educational outcomes for children and reduce overall poverty and inequality. A follow-up program to the RPS is highly recommended, and should be broader in scope than the original. The eventual goal is a nationwide roll-out for people under a certain income line, which should happen step-by-step, and may need tailoring region to region.

That said, it is crucial to remember that CCTs cannot complete our goals as a stand-alone program. Complementary programs are also necessary. The World Bank report reminds us "that even the best-designed and best-managed program cannot fulfill all of the needs of a comprehensive social protection system" (Fiszbein, 2009, p. 2). The other interventions they - and we - recommend are the development of additional social programs, including workfare or employment programs and social pensions. These will take time to implement, and should pay attention to rural areas and women's empowerment as well as addressing overall poverty.

Additionally, CCTS cannot stand alone as an educational system. The program is very good at increasing attendance. However, quality is important as well, although quantitative factors can be difficult to interpret. When looking at education, some statistics can be deceiving. Education systems vary greatly from country to country and the quality of education is important to consider as opposed to simple enrollment rates.

Many qualitative indicators paint a distressing picture: a Nicaraguan teacher's salary is one of the lowest in the region, and shows no sign of significantly improving anytime soon (Hutt, 2013). The Nicaraguan government has invested 3.4% of the country's 2012 GDP in education, with a cut in spending expected at the time of writing (Hutt, 2013). Average classroom sizes are also very large, often spiking to 40 students/teacher, especially in rural areas. (World Bank, 2008). Any solution will need to at least address these problems if they cannot rectify them.

Another indicator that is extremely important to consider is adult literacy rates. A paper in the Economics of Education Review called, "Non-formal basic education as a development priority: evidence from Nicaragua", studied the effects and impacts of non-formal adult literacy programs in Nicaragua to deduce how important literacy improvement strategies are for human development. The paper recognized that fact that primary education is widely seen as an important human right and an important factor in poverty reduction, but makes note of the fact that adult literacy is coupled with vital life-skill components that are just as crucial in human development and poverty reduction.

The programs referred to by the paper were for individuals aged 15 years and older. The study controlled for poverty and other family-level determinants of learning and found that the non-formal programs had significant impacts to those who chose to participate. According to the

study, “those who have had more exposure to the program, reported being more likely to join a social group (by 10% points), help their child with homework (7% point increase), had greater expectations for their children's education (6–7 point increase), and felt the program would improve their social and work relationships and economic situation (12–14% point increases)” (Sudhanshu Handa et al., 2009). While most research focuses on how great returns are on bettering primary education for developing countries such as Nicaragua, adult literacy is another aspect to education that should not be ignored. Helping the adult population of Nicaragua become more educated, even informally, will show returns through them, as well in further involvement and enthusiasm towards primary education, so we recommend a program to improve adult literacy rates as well as primary education. A more educated populace not only values education more; it also makes better decisions; and is likely to save more.

Education may improve investment and savings on its own; however, these indicators can be addressed directly. Investment and savings are one of the more difficult things to improve. Savings rates have complex and multifaceted determinants; however, it is important to note that savings cannot happen in any household that must consume its entire income for survival. Therefore, reducing poverty will be our primary policy to target the savings rate at first. On the other hand, investment has many policies that have proven to be successful in other developing nations, under the right circumstances. Such policies exist on both national scales at the highest levels of government, and on micro-scales, in individual communities.

For national policies, perhaps the most successful stories are those of South Korea and Taiwan, known for their massive strides in economic development, particularly with regards to income per capita. In particular, they are hailed as government interventions being done right, the

investments successful because they were an override of coordination failure. According to this case study, modernization requires specialized inputs which "require well-educated workers but at low cost; …exhibit scale economies; and…cannot be perfectly traded in international markets" (Rodrik, 1995, p. 163). Therefore, our plans to improve education are crucial to someday reaching our development goals; modern industry requires a well-educated workforce. Once Nicaragua has sufficient skilled laborers, the recommended policy is to pour resources into making a strong modern sector.

The bedrock of every industrial sector, especially more modern ones, is infrastructure, and this is a weak point among Nicaragua's otherwise stellar development indicators. The country has one of the lowest electrification rates in Central America, around 78% according to the CIA's Factbook, and comes in 101st place on the CIA's rankings on "Total length of the [county's] road network", right below North Korea and Puerto Rico. Many of these problems are borne of the Nicaraguan Revolution. When the Sandinistas took power, the country was ruins, "with a stagnant economy and a debt of about US$1.6 billion" and hundreds of thousands of displaced citizens (Merrill, 1998, pg. 38). Additionally, pressure on the government for support of agricultural workers has impeded the development of industry and manufacturing. Economic advancement is particularly unequal between regions of Nicaragua. Illustrating this is the fact that the electrification rates of Urban and Rural Nicaragua are vastly different: 100% and 43%, respectively. The facts speak for themselves: Nicaragua has a glaring lack of infrastructure away from it's population centers. One particular place this deficit rears it's ugly head is in primary and secondary schooling. It can be said that a lack of infrastructure surrounding and supporting schools is a great millstone around the neck of Nicaragua's gains in educating its populace.

The American Nicaraguan Foundation is a charitable organization dedicated to the betterment of Nicaragua's most vulnerable populations. They summarize the problems facing Nicaragua's education system thusly, "Nicaragua's education sector fares poorly" and "70% of children in Nicaragua complete primary school" (World Bank, 2012). This organization has focused it's efforts in improving Nicaragua's educational situation by helping families with indirect costs (e.g. school lunches, pencils, uniforms, etc.). While their actions are noble and try to provide goods needed by every student, one must consider whether such a program is undercutting local businesses or unhelpful those with other obstacles to educating their child. This, however, is a problem CCT's address neatly. A proper development program should also look at the larger indirect cost of transportation.

The words "Investing in Infrastructure" often conjures up images of vast (and very expensive) construction projects. While the building of new highways can bring many benefits to a region they span, for infrastructure improvements to aid in the educational sector, they must start from the ground up. The key word of a future development project should be "improvement" rather than "construction." Around 3000 of Nicaragua's ~24,000 km of road network are paved (CIA, 2017). With fierce monsoon rains being a regular occurrence in a tropical country like Nicaragua, this needs to be addressed, with particular attention being paid to roads commonly used by local communities. With such a localized focus, reaching out to the community and local governments is inevitable and crucial. These local organizations need to be equipped to respond to seasonal weather fluctuations. As demanding as this can sound, the earlier examples of the "East Asian Tigers" are excellent indicators of the potential payoffs of universally accessible education. A major advantage that Taiwan and South Korea had when they began their explosive growth in the 1960's is a skilled workforce. (Rodrik, 1995) It is further clarified that as these

countries made sure to not leave rural populations out of their education improvements, thus avoiding the huge divide we see in Nicaragua today.

Electricity is another big improvement that will help support Nicaragua's school system. A United Nations report outlines the many benefits bringing electricity to local schools can bring: "Lighting can enable classes to be taught early in the morning or late at night." and "Electrified schools have better staff retention, outperform non-electrified schools on key educational indicators, and can in some cases enable broader social and economic development of communities" (UNDESA, 2014). An excellent example of the "broader social and economic development" electricity can bring is a study focused on Brazil. The "*Luz para Todos*" (Light for All) program was set up with the express purpose of "providing electricity to rural and isolated areas." (Bezerra, 2017). This was an attempt to empirically measure the benefits gained from electrification of Rural areas. The results were significant gains being made across every indicator in the Human Development Index, with "the education component having the strongest effect." (Bezerra, 2017) Such strong results only point to rich returns coming from expanded power access to Nicaragua's schools.

There are obviously many obstacles to bringing electricity to every region of Nicaragua. Long sets of transmission lines are expensive projects, especially in remote and treacherous regions. It is for this reason we advise against the traditional method of expanding a centralized power grid. This method has been the status quo of increasing power access, and has not been working for the rural citizens of Nicaragua. Rather, a decentralized approach to power access must be taken. The *Ministerio de Energia y Minas* (MEM) and the UNDESA (on page 28) are both in agreement that rural communities can best acquire electricity through maintaining local

autonomous power supplies. A program to bring smaller scale generators and energy sources to rural schools can potentially be undertaken. Powering educational facilities still must remain being the central focus of any potential distributive program of this type, despite any outcry that might come from the limited scope of such a program. In the realm of educational development, the benefits will manifest themselves in the long-run.

Although Nicaragua has strong GDP growth and has made great strides over the last twenty years, we have pinpointed poverty, savings and investment as crucial areas for continued growth and development. Our long-term plan for development focuses on building a modern industrial sector; however, this will not be effective until Nicaragua has a skilled labor force. Information, expertise and technology can be brought in from other countries; education starts locally. CCTS have been proven to have long-term efficacy in increasing education rates and directly impact poverty. We recommend rolling out a nationwide CCT program based on the earlier RTS. Adult literacy rates also impact how much a family values education, so a program to improve the literacy of current adults is also highly recommended to increase the number of children attending school and their performance. Finally, supporting electric and transportation infrastructure, among other benefits, increases the number of hours students can devote to study, and improves students access to education. Overall, as a start to our economic changes, we recommend a focus on education, as that will have a significant overflow to health and poverty, as well as putting us on the track to greater development.

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