

## Nicaragua: Background Study

### The agricultural education pipeline



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This document was written as part of a series of InnovATE AET background studies, which are conducted on the AET system in a particular country, at times with particular attention paid to an AET institution or program. Background studies are based partially on USAID mission interest, partially on the presence of interesting AET activities or problems, and on providing a geographical balance. Most of the initial work on the studies will be done through desktop review of available literature and communication with experts. The remainder of the information is sometimes amassed through data collection visits. Lessons learned in one country can often be applied in other countries.

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## Introduction

Nicaragua is highly dependent on agriculture which makes up approximately 30% of the GDP and absorbs 43% of the workforce (Dimas, 2003). Nicaragua has a disproportionately large amount of youth in comparison to the population; a phenomenon termed a “youth bulge,” and is plagued with high levels of poverty and low levels of productivity (Gurdian & Navarro, 2007). In 2007, Gurdian and Navarro reported that the average school level of the population aged 15 and older is only 4.8 years, decreasing to 3.5 years in rural areas, and below 2.4 years among the rural poor. This is particularly alarming as, “within agriculture, more education renders a [Nicaraguan] worker 10 percent less likely to work as a family enterprise worker, the lowest earning category. Outside of agriculture, more education increases the likelihood of being an employer (by 34 percent), being a wage worker (by 34 percent), and being self-employed (by 17 percent)” (Guitierrez, Paci, & Ranzani, 2008, p. 96). Additionally, for each year of secondary schooling it is estimated that a Nicaraguan worker earns 10.3% higher wages. However, 72% of the population does not finish secondary school and are expected to earn below the poverty line (Angel-Urdiñola & Laguna, 2008). Clearly, improving the education system, including agricultural education, is paramount for poverty alleviation in Nicaragua.

Innovation for Agricultural Training and Education (InnovATE) is a USAID-funded project supporting the capacity development of agricultural training and education systems from primary school through secondary institutions as well as vocational and technical schools and universities. The InnovATE program, implemented by a consortium of US universities led by Virginia Polytechnic and State University and including Pennsylvania State University, Tuskegee University, and the University of Florida, aims to strengthen the range of institutions that train and educate agricultural professionals (InnovATE, 2013).

The InnovATE program takes a “learn, design, train” approach to capacity development. The “learn” component of the program aims to “provide educators and practitioners with good practices and tools that promote agricultural training and education systems development” (InnovATE, 2013). In support of the “learn” component of the InnovATE program, a series of country desk studies will be commissioned to provide relevant background information to inform a basis for identifying gaps in Agricultural Training and Education (ATE) programs and institutions in target InnovATE countries. This paper aims to explore agricultural education in Nicaragua to better understand the overall educational structure, participation and performance in the educational system from pre-primary through tertiary and vocational institutions, the availability of agricultural education in Nicaragua, and gaps in and barriers to agricultural education.

The first section of the paper will describe a brief history of politics in Nicaragua that has led to the current educational structure. The second section will describe the overall structure of the Nicaraguan education system from pre-primary through tertiary and vocational education. The third section will provide background information on participation and performance in the educational system. The fourth section will provide information on the availability of formal agricultural education. The fifth section will discuss gaps in and barriers to agricultural education. The final section will discuss next steps. Lastly, appendix B offers insight into data pertinent to the report and background for project or investment proposals.

## Educational History

The educational system in Nicaragua, including the focus on alternative schooling and adult education, is the direct result of its political history from the dictatorships under the Somoza dynasty, to the decade of rule under the Sandanista National Liberation Front (Frente Sandinista de Liberación Nacional [FSLN]), and to present day. Under the Somoza dynasty, education was the privilege of the

wealthy class with few educational opportunities in rural areas, illiteracy as high as 75%, and fewer than 50% of children in primary schools.

“The education system in general reflected the larger social structure. It served the privileged, in particular the urban and economic elites who were the main benefactors of national development (and the capitalist relationship with the US) (Miller, 1985). Access to schools was concentrated in the colonial capitals of power on the Pacific Coast, to the neglect of the Atlantic Coast and the indigenous populations that live there (Miller, 1985). The education system overtly functioned to maintain the social, political, and economic structures of power” (Sanyal, 2009, p. 34-35).

After 43 years of rule, the Somoza family was overthrown during the Nicaraguan revolution by the Sandinista National Liberation Front. Contrary to the Somoza government, the FSLN government saw education as a tool for political consciousness raising and social change. “Toward that end, the educational system was expected to foster the formation of a ‘new person,’ a more critically conscious and participatory citizen motivated by collective goals, and also to promote the transmission of the skills and knowledge necessary to overcome decades of underdevelopment and set the nation on the path of self-sustaining growth” (Arnové, 1995, p. 28). The FSLN implemented multiple education campaigns including free and compulsory primary education; a national curriculum; an indigenous language education program; higher education programs focusing on agriculture, industrial, and vocational training; and the National Literacy Campaign. The latter program, implemented through the mobilization of a mass of volunteer teachers, had a significant impact on illiteracy in its first year of implementation (Sanyal, 2009).

The impact of the FSLN education measures was undeniably impactful. Arnove (1995) notes, “Between 1979 and 1984, those participating in pre-university education grew from 540,688 to 758,203. By 1984, approximately one-third of the total population was participating in some form of systematic education” (p. 29). Unfortunately, despite the initial successes of the FSLN education campaigns, long-term success was stalled due to continued armed conflict.

In 1990 the Sandinista reign ended and was replaced by the election of Violeta Chamorro. The Chamorro administration, with a political bent more toward neo-liberalism than the previous socialist-leaning government, tore down many of the Sandinista programs and re-reformed the curriculum to remove the Sandinista ideals and to focus more on religious Catholic ideals (Arnove, 1995; Gillies, 2010). She also began what many term a radical decentralization process called the School Autonomy Program (Programa de Autonomía Escolar [ASP]) (Sanyal, 2009). The goals of the ASP were to provide more direct control over education to the parents and teachers with the idea that locally governed schools are more responsive to local needs and that participation of parents would motivate teachers. This included making the community responsible for generating some of the funds for their schools and teacher salaries (Parker, 2005). By 2002, 63% of all primary and secondary students were attending Autonomous Schools (Di Gropello, 2005a). As of 2006, the ASP schools still make up a significant proportion of public schools in Nicaragua, particularly on the Caribbean Coast, estimated at 70% of Nicaraguan schools.

Through the changing political landscape in Nicaragua, many of the successful reforms by both the Sandinista government and the subsequent governments beginning with Chamorro have not endured. “Over the past 20 years, the education system in Nicaragua has undergone substantial turnover at all levels of the system... Perhaps the most dominant aspect of education in Nicaragua has been the divisive and partisan nature of education reform” (Gillies, 2010). Arnove (1995) attributes this to political ideology:

“The [Chamorro administration] first tore down much of the educational edifice that had been constructed during the decade of Sandinista rule... to dismantle what it viewed as an oppressive state apparatus and exorcise educational content it considered inappropriate, if not antithetical, to the values it wished to propagate. What the educational system needed and did not receive, however, was continuity in those programs that were working well and a concerted effort by educators of all political stripes to improve curriculum, materials, and methods” (p.52).

It is also clear that political power shifts continue to affect the success of education in Nicaragua such as recent changes under Daniel Ortega’s administration reflecting a return to Sandinista ideals

(Gillies, 2010). For example, Hill (2013) reports that Ortega is dismantling the ASP programs saying: “The new education minister has effectively inverted the autonomous school governance reform in Nicaragua putting more authority and decision- making power to the Ministry of Education suggesting that political will for any reforms will likely be implemented from ministerial mandate” (Hill, 2013, p.10). According to Gillies (2010), Ortega’s administration claims that this is due to the burden of school fees placed on students who attend autonomous schools and the goal of the current government is to re-centralize education.

## Educational Structure

The education system in Nicaragua is under the direction of the Ministry of Education (MINED), the National Technical Training Institute (Instituto Nacional Tecnológico [INATEC]) which is under the auspices of the Ministry of Labor, and the National Council of Universities (Consejo Nacional de Universidades [CNU]). Within these governmental institutions are five educational subsystems, including three under housed under MINED. These are (1) the basic education, secondary, and teacher education subsystem (2) the Regional Autonomous Education Subsystem (El Subsistema de la Educación Autonómica Regional [SEAR]), and (3) the extracurricular education subsystem which refers in part to adult education. The (4) technical education and professional training subsystem is the responsibility of INATEC, and (5) the higher education subsystem is under CNU (Näslund-Hadley, Meza, Arcia, Rápalo, & Rondón, 2011; Olivares, 2011; Singh & Mussot, 2007). There is some overlap between MINED and INATEC in the oversight of the technical training and the SEAR subsystems which will be discussed further.

In 2008, Nicaragua’s education system had a total of 10,721 schools, 85% of which were public and 15% of which were private. The majority of school infrastructure was located in rural areas amounting to 79% of the total. In the same year, pre-primary education counted for 12.7% of all



students, 56.1% for primary education, 24.6% for secondary education, 5.5% for adult education, and 1.2% for all other modes (Angel-Urdiñola & Laguna, 2008).

The 200 day school calendar is divided by MINED, requiring that 70% of school days (approximately 140 days) focus on the National Core Curriculum with the remaining 30% (approximately 60 days) focusing on content that is relevant to the local context. Within these 60 days the teachers must include 11 days for evaluation workshops and six days for finals, leaving 43 days of curriculum outside of the National Core Curriculum (UNESCO, 2010).

### *Pre-Primary Education*

Pre-primary education is free in public schools and is available to students under six years of age. Private pre-schools are available although most parents use the public school system, with only 15.7% of parents using a private pre-school in 2005 (Angel-Urdiñola & Laguna, 2008). Pre-primary education operates formally or informally. Formal pre-primary education is available in urban areas through dedicated pre-school centers or through pre-schools attached to primary schools. Teachers in formal pre-primary schools are required to have a primary school education. Informal pre-primary schools occur in peri-urban and rural areas. These schools are typically run by volunteer parents, churches, community centers, and out of private homes. Informal pre-primary school teachers are elected by the community and funds are typically donated by government institutions or non-governmental organizations (NGOs) (UNESCO, 2010).

There are three years of pre-primary education including a cycle for 0-3 years of age, 3-5 years of age, and 5-6 years of age (UNESCO, 2010). Typically, students participate at three, four, and five years of age. Participation in pre-primary education is not compulsory. Promotion through pre-primary education is automatic and students cannot repeat a year of school at this level (Angel-Urdiñola & Laguna, 2008).

### *Primary Education*

Compulsory education begins at the primary school level at six years of age and is required until 12 years of age. Primary education is broken into two cycles including cycle 1 for grades 1-4 and cycle 2 for grades 5-6. Primary education is also available in alternative modalities including: multigrade classrooms which are typical in rural regions, primary evening sessions for over-aged students (typically adults), special education, basic accelerated youth programs, and through the bilingual intercultural education program (Programa Educativo Bilingue Intercultural [PEBI]) (Angel-Urdiñola and Laguna, 2008; Bernheim, 2008; UNESCO, 2010).

### *Secondary Education*

Secondary education is free and is not compulsory. It begins in grade seven and continues until grade eleven, from ages 13-17. The secondary system is divided into four modalities including: daytime-secondary, nighttime-secondary, distance-secondary, and secondary education for adults (Angel-Urdiñola & Laguna, 2008). Similarly to primary education, the secondary system is broken into two cycles including cycle 3 for grades 7-9 and cycle 4 for grades 10-11 (Bernheim, 2008; UNESCO, 2010). The third cycle leads to a basic diploma which allows for graduation and entry into the labor force, or continuation on to technical school or continued academic studies. The fourth cycle leads to a general bachillerato or technical diploma (Bernheim, 2008; UNESCO, 2010).

The 2010 UNESCO report on education in Nicaragua outlines a new method of promotion in the secondary school academic track that was piloted in 2009 and was to be implemented in all schools by 2011. In this system, promotion is based on a set of standards for each grade level and is certified by the school director and confirmed by the municipality. To graduate with a bachillerato, a student must choose a plan of study for the 11<sup>th</sup> grade; perform 60 hours of ecological service; conduct a research project; and pass public oral exams in Spanish, mathematics, natural science, and social science.

### *Tertiary Education*

There are 37 universities in Nicaragua with an estimated 100,000 students. This includes 650 majors with 90% of students enrolled in “traditional majors” and less than 10% in technological majors. This results in a large amount of unemployed graduates in traditional careers and a lack of graduates in technical fields (Näslund-Hadley et al., 2012). There are private and public universities in Nicaragua both of whom are governed by CNU. Private universities must receive authorization from CNU to operate but are not legally accountable to CNU. The National Agrarian University (UNA) is the public institution primarily responsible for agricultural education with some private universities offering agricultural majors as well. Several universities have entered into agreements with INATEC for the design of technical professional training courses linked to various programs. These universities include UNI, UNA, the National Autonomous University of Nicaragua (UNAN), and the University of the Autonomous Regions of the Nicaraguan Caribbean (URACCAN) (Bernheim, 2008; Vijil, Castillo, Vado, Elvir, & Castro, 2007).

In 2006 as a part of education reforms, a law was passed to create the National Counsel for the Evaluation and Accreditation of the National Education System (Consejo Nacional de Evaluación y Acreditación del Sistema Educativo Nacional [CNAE]). This organization was made responsible for the accreditation of public and private universities and to evaluate the outcomes of MINED and INATEC educational programs (Bernheim, 2008).

### *Autonomous Schools and Decentralization*

The Ministry of Education started the school decentralization program in 1993 as part of a set of reforms to improve the efficiency and effectiveness of Nicaraguan Schools. Interestingly, the school decentralization program was implemented by ministerial directive and was initially not a part of



The Autonomous School Program sought to give more power and autonomy to local teachers and parents with the goals to: “(1) Increase community participation in educational administration, (2) Obtain financial resources for schools beyond government funding, and (3) Increase efficiency in the use of human and financial resources for schools” (Parker, 2005, p. 360). The ASP initially began in 24 secondary schools (Di Gropello, 2005a). By 2006, over 70% of Nicaraguan schools were autonomous, accounting for 83% of all students (Angel-Urdiñola & Laguna, 2008). This includes the SEAR autonomous school system, serving the ...“educational priorities of the multi-ethnic population, multilingual and multicultural of the Autonomous Regions of the Nicaraguan Caribbean coast” (UNESCO, 2010, p. 7). Several reports suggest that the ASP schools appeared to be better equipped and better attended than traditional schools (Di Gropello, 2005a; Porta & Laguna, 2007; Sanyal, 2009). There is some evidence that the autonomous schools result in fewer teacher absences, more teacher hours worked, and less canceling of classes than in traditional schools (Di Gropello, 2005a). The results of the local decision-making process, typically done by school councils, varied with some schools reporting more democracy and autonomy in decision making and others reporting that school directors retained too much power. In schools where the decision making was perceived to be more autonomous, student achievement in ASP schools reportedly was greater than traditional schools (Sanyal, 2009). Porta and Laguna (2007) note the international recognition given the ASP schools stating:

“It is noteworthy that Nicaragua’s school autonomy process was positively assessed four times by the World Bank. The last assessment was made by Arcia, Porta and Laguna in 2004 (Arcia et al., 2004b) and examined the impact of school autonomy on primary and secondary educational centers in terms of participation by the community, pedagogical and administrative aspects, and pupil performance. Among the main findings of the study are: (a) school autonomy has a slight but significant impact on the academic performance of pupils; (b) the autonomous centers have lower dropout and repetition rates than the centralized centers over time; and (c) the autonomous centers show a greater perception of influence in decision-making” (Porta & Laguna, 2007, p. 14).

In 2002 with the introduction of the Participation in Education Law, the school autonomy program was officially backed by legislation (Vijil et al., 2007). In 2006, the General Education Law further divided the program into subsystems such as including autonomous school systems in the North Atlantic, South Atlantic, and Caribbean Coast (UNESCO, 2011; Vijil et al., 2007). The current status of the ASP and municipal decentralization programs seems to be leading towards re-centralization of the school systems. According to Porta and Laguna (2007), in early 2007 the government of Daniel Ortega dismantled the autonomous school program returning power to the Ministry of Education (Hill, 2013). In 2010, the Ministry of Education was separated into three divisions including: 1) General management of regular basic and secondary education; 2) General management of non-regular basic and secondary education and 3) General management of coordination and liaison between the MINED and SEAR. However, the cost of the integration of SEAR into the national education budget is still pending; current funding is made available through the support of the governments of Finland, Sweden, and Spain (Rossmann-Hooker, 2011, p 57-58). Moreover, it appears that SEAR schools in the Autonomous Regions (Rossmann-Hooker, 2011) and the Caribbean Coast (Bluefields-RAAS, 2011) are still operating independently.

#### *The National Technological Institute*

INATEC, operating under the Ministry of Labor, is the institution responsible for technical and vocational education for adults over the age of 14. INATEC offers both professional and technical certificates and degrees in 55 centers, and offers educational programs in 350 private centers. There are three sectors that INATEC covers including agriculture and forestry at 13% of enrollment, industry and construction at 19% of enrollments, and trade and services at 68% of enrollments (Vijil et al., 2007).

The primary responsibilities of INATEC include: guiding and implementing policies for vocational and technical training; implementing vocational training programs for ages 14 and older; implementing

special training programs for women, the disabled, cooperatives, and small enterprise; organizing, planning, monitoring, and evaluating training activities for semi-skilled, skilled, basic technical, and technical labor; strengthening vocational opportunities based on the local context and labor demands; and providing technical assistance to managers, technical centers, and vocational institutions (UNESCO, 2010). A student participating in INATEC education is prepared to enter the workforce, although they may also proceed to the tertiary level of education depending on the certificate or diploma they received (UNESCO, 2010).

## Educational Funding and Expenditures

Educational budget and spending has increased in recent years, though it is still at a level below other Central American countries (Vijil et al., 2007). “In Nicaragua, the budget allocated annually to education is of 4% of the Gross Domestic Product (GDP), while in neighboring countries such as Honduras that figure is of 6% or 7%” (Vijil et al., 2007, p. 6). Overall, the primary and tertiary systems receive the greater allocation of funds in comparison with secondary education (Vijil et al., 2007). Additionally, while Nicaragua has seen an increase in budget allocation to education, this increase does not take into account the increased numbers of students attending school (Hill, 2013).

The funding structure in Nicaragua is considered regressive with educational spending benefiting the rich over the poor (Näslund-Hadley et al., 2012). “This contrasts significantly with the situation in 2001, where education was more progressive, benefitting the most poor. In 2001, 51% of the public primary school enrollment represented the two poorest quintiles” (Näslund-Hadley et al., 2012, p. 17 [translated]). Vijil et al. (2007) finds that the increase in investment in education has mainly benefited higher education, with the relative proportion of money allocated to primary and secondary schools remaining unchanged. He attributes this to pressure from the university system stating: “It can be noted that priority was assigned to primary education. Investment per student in higher education,

where growth was also high, can be attributed not so much to an explicit policy to favor universities, but rather to pressure exerted by the university community to achieve increases in budget allocations (p. 18).”

The funding mechanism for INATEC comes in part from government allocation through a 2% deduction of the total wages of state employees (Vijil et al., 2007). This funding is insufficient for the demands placed on INATEC and institutional weakness within the organization results in little communication and collaboration between INATEC and MINED on budgetary needs. A significant amount of funds come through payroll deductions from private and public companies. In return, these companies enter into training agreements with INATEC that result in the prioritization of technical education for companies rather than for the public sector. This model, however, is not sufficient to meet the needs and demands of the INATEC program and additional funds are allocated from other organizations such as some funds from MINED and from international donors. It is also reported that lack of autonomy at the level of individual INATEC centers makes it difficult, if not impossible, for centers to interact with donors directly (Vijil et al., 2007). Funding issues have a significant impact on the efficacy of INATEC.

## Participation and Performance

Nicaragua has improved in many aspects of school participation and performance including significant increases in enrollment in the primary and secondary levels. However, it continues to be plagued with issues in transition from primary to secondary school, in student retention, in matriculation, and in quality of education. Näslund-Hadley et al. (2012) notes that Nicaragua has the greatest number of out-of-school students and lowest graduation rates in Latin America, stating that major issues facing the Nicaraguan school system include low quality, inequality between socioeconomic groups, and inferiority to other countries in Latin America. “In Nicaragua... only 61% of children have



reached grade 4, of whom 74% achieved the expected minimum learning level... in other words, only 46% of the cohort is expected to achieve the minimum learning level” (UNESCO, 2012, p. 124).

Nicaragua ranks 101<sup>st</sup> out of 120 countries on the Education for All (EFA) Development<sup>1</sup> Index (EDI)<sup>2</sup> in comparison with Honduras ranked at 90 and Guatemala ranked at 92. The EDI index calculates the EDI standings based on a combination of primary adjusted net enrollment, adult literacy, gender, and quality of education as measured by survival to grade five. Each indicator is calculated on a scale of 0-1 with a score of 1 indicating full achievement across the EFA goal (UNESCO, 2012c). When comparing Nicaragua with other Central American countries of similar economic standing, Nicaragua has the lowest primary adjusted net enrollment with a score of .939 (Table 1), although this number does indicate a high number of children enrolled in primary education. The adult literacy rate is low with a score of .78 falling just above Guatemala with a score of .752. In regards to gender, Nicaragua is on par with other countries in the region at a score of .962 indicating near gender parity in primary school education. The quality of education in Nicaragua is ranked the lowest in the region with a score of .514, which is significantly lower than Guatemala at .706 and El Salvador at .894. This indicates a significant issue in the quality of education and retention rate in Nicaraguan schools in comparison with other EFA countries.

**Table 1. Standard EDI for Select Central American Countries**

Rank	Country	EDI	Primary adjusted net enrollment	Adult literacy rate	Gender specific EFA index	Survival rate to grade 5
77	El Salvador	0.913	0.953	0.845	0.962	0.894
90	Honduras	0.884	0.972	0.848	0.938	0.778
92	Guatemala	0.841	0.986	0.752	0.962	0.706
101	Nicaragua	0.799	0.939	0.780	0.962	0.514

*Adapted Table EDI.1: The EFA Development Index and its components, 2010. (UNESCO, 2012c)*

<sup>1</sup> Education for All is an agreement between nations to reach six worldwide educational goals identified at the 2000 World Education Forum in Dakar by the year 2015.

<sup>2</sup> The EDI provides statistics on the progress of educational systems towards the achievement EFA goals. The index currently measures universal primary education, adult literacy, quality of education, and gender parity. (UNESCO, 2000)

### *Pre-Primary Participation*

Enrollment in pre-primary education has increased significantly since 1999 from 28% of children to 55% of children (Table 2). Although this represents a doubling of students attending pre-primary school between 1999 and 2010, this number is low in comparison with El Salvador at 64% and Guatemala with 71%. Of those enrolled in 2010, slightly more students are female than male giving a Gender Parity Index (GPI) of 1.03 which is considered to be achievement of gender parity.

**Table 2. Gross Enrollment Ratio (GER)\* in Pre-Primary Education (%) in Select Central American Countries**

Country	1999				2010			
	Total	Male	Female	Gender Parity Index (F/M)	Total	Male	Female	Gender Parity Index (F/M)
El Salvador	41	40	41	1.02	64	63	65	1.02
Guatemala	46	46	45	0.97	71	70	72	1.02
Honduras	22	21	22	1.05	44	43	44	1.03
Nicaragua	28	27	28	1.04	55	55	56	1.03

\* Enrolled children of all ages/total number of children in the official school age group.

*Adapted Table 3B: Early childhood care and education. (UNESCO, 2012c)*

The gross participation rates in pre-primary education mask both double-counting of students who move through the pre-primary school system, and significant differences between urban and rural participation in pre-primary school (Kraft, Tablada, & Cerna, 2009). “Analysis of preschool coverage of children between age 4 and 6 shows that half of children in the highest quintile go to preschool, whereas only 1 out of every 4 children from the 20% of poor households attend that same education level” (Angel-Urdiñola & Laguna, 2008, p.9). This is particularly true for children from rural agricultural households and indigenous households (Angel-Urdiñola & Laguna, 2008). The lowest rates of participation are found in the Caribbean Coast which has the highest level of poverty (Kraft et al., 2009).

### *Primary Participation*

The net enrollment ratio (NER) in primary education, which indicates the percentage of students of school-age (discounting over-aged students) enrolled in school, shows an increase from 78% in 1999

to 92% in 2010. This is a significant jump when considering that Nicaragua increased its enrollment rate by 14% over the ten year period. Despite this increase, Nicaragua continues to have the lowest NER in comparison with other Central American countries (Table 3). It should be noted that NER scores are a measure of enrollment and as such, does not reflect students who are enrolled but not attending school.

Nicaragua's GPI in this period has remained consistent at 1.01, indicating gender parity in primary school education. The total number of out-of-school children decreased significantly from 153,000 students out of school in 1999 to 48,000 students out of school in 2010. The gendered percentage of students out of school has changed slightly from 47% of total out of school students being female in 1999, to 44% being female in 2010. This represents a greater number of out of school boys in Nicaragua, though this is not uncommon for the region and Nicaragua's percentage is near the mean (Table 3).

**Table 3. Net Enrollment Ratio (NER) in Primary Education (%) in Select Central American Countries**

Country	Net enrollment ration (NER) in primary education (%)								Out of school children (000)			
	1999				2010				1999		2010	
	Total	Male	Female	GPI (F/M)	Total	Male	Female	GPI (F/M)	Total	% Female	Total	% Female
El Salvador	84	84	85	1.01	94	94	94	1.00	128	47	38	48
Guatemala	83	86	79	0.91	97	98	96	0.98	289	61	32	86
Honduras	89	88	89	1.01	96	95	97	1.02	115	48	31	27
Nicaragua	78	77	78	1.01	92	92	93	1.01	153	47	48	44

*Adapted Table 5: Participation in primary education. (UNESCO, 2012)*

Despite significant gains in student enrollment, the Gross Enrollment Ratio (GRE), which indicates the total number of students enrolled in school including over-aged and repeater students, increased from 102% in 1999 to 118% in 2010. This number is consistent with nearby Central American countries and indicates a high number of over-aged children enrolled in primary school (Table 4). Late-enrollment in Nicaragua in the first grade is common in the poorest quintiles, in rural areas, and for male children (Angel-Urdiñola & Laguna, 2008).

**Table 4. Gross Enrollment Ratio (GER) in Primary Education (%) in Select Central American Countries**

Country	Gross enrollment ration (GER) in primary education (%)								Enrollment in private institutions as % of total enrollment	
	1999				2010					
	Total	Male	Female	GPI (F/M)	Total	Male	Female	GPI (F/M)	1999	2010
El Salvador	106	108	104	0.97	114	117	111	0.95	11	10
Guatemala	102	109	94	.087	116	119	114	0.96	15	10
Honduras	107	107	108	1.01	116	116	116	1.00	...	9
Nicaragua	102	102	102	1.01	118	119	116	0.98	16	16

*Adapted Table 5: Participation in primary education. (UNESCO, 2012)*

These issues are further illustrated by the primary cohort retention rate which is estimated at 46% in Nicaragua indicating significant dropout and poor retention rates. Of this 46%, only 42% of boys are estimated to finish school with their cohort as opposed to 50% of girls, indicating a higher repetition and dropout rate among boys (UNESCO, 2012c). Further, it is estimated that only 44% of primary aged students reach the final grade of primary school within six years (Näslund-Hadley et al., 2012; Zabaleta, 2011). Angel-Urdiñola and Laguna (2008) discuss this phenomenon stating that:

“Castro (2005) insists that the phenomenon of grade repetition is a complex problem influenced by several factors, such as the quality of teachers, the capacity of school principals to monitor, supervise and advise teachers, the decisions made by households to withdraw their children from school, and the MECD’s own support and monitoring structures, among others. Therefore, solving this problem requires several strategies and actions that consider all of these aspects.”

The phenomenon of high enrollment in primary school combined with high retention and dropout rates has earned Nicaragua a label of “high enrollment, low survival” by UNESCO (Spier, Padilla, Osher, & Tolani-Brown, 2009). Rural-urban disparities in primary education have improved with data showing that “from the 1993-2005 period... children in the lowest quintile not attending school has diminished by 25.5 points among the 7 to 12 age group” (Angel-Urdiñola & Laguna, 2008, p. 6). However, despite these gains Nicaragua still has significant rural-urban disparities compared to other countries in the region (Angel-Urdiñola & Laguna, 2008; Sanyal, 2009).

#### *Secondary and Vocational Participation*

Data for net enrollment in secondary school in 2010 is not available; however, the gross enrollment rates (which include over-aged participation) were available for 1991 and 2010. Gross enrollment in secondary school in Nicaragua increased from 52% in 1991 to 69% in 2010, which is on a similar level to El Salvador and Honduras. This includes an increase in male participation from 47% to 66%, and an increase in female participation from 56% to 73% over this time period (Table 5). Nicaragua's GPI in 2010 is a 1.10 indicating that significantly more girls are enrolled in secondary school than boys. Of those enrolled in secondary school, 22% attend private institutions.

**Table 5. Gross Enrollment Ratio (GER) in Secondary Education (%) in Select Central American Countries**

Country	Gross enrollment ration (GER) in secondary education (%)								Enrollment in technical/ vocational programs as % of total enrollment in secondary education				Enrollment in private institutions as % of total enrollment
	1991				2010				Total Secondary 2010		Upper Secondary 2010		
	Total	Male	Female	GPI (F/M)	Total	Male	Female	GPI (F/M)	Total	Female %	Total	Female %	2010
El Salvador	53	53	52	0.98	65	65	65	1.01	18	52	55	52	16
Guatemala	33	36	30	0.84	59	61	57	0.93	27	51	87	51	67
Honduras	35	33	37	...	73	66	81	1.23	46	56	82	58	25
Nicaragua	52	47	56	...	69	66	73	1.10	16	49	44	49	22

*Adapted Table 7: Participation in secondary education. (UNESCO, 2012)*

Although Nicaragua's GRE is similar to other Central America countries, there are significant issues in enrollment, retention, and dropout rates, as well as significant rural and urban disparities. Zabaleta (2011) states, for example that: "the net enrolment rate in this level only reaches 46% in Nicaragua – the lowest rate in the region along with Guatemala's – compared to 72% on average for Latin America" (p. 1527). This low NRE is due in part to low transition rates where after the age of 12, or the end of primary school, the probability that a student will stay in school drops by 24% per year. This number is even more telling when considering that the probability drops 19% in urban areas as compared to 29% in rural areas (Angel-Urdiñola & Laguna, 2008). Interestingly, indigenous children have a higher probability of being enrolled after age 12 at 5% more likely overall, and 11% more likely in urban areas.

Angel-Urdiñola and Laguna (2008) find that: “Individuals between 12 and 23 years who have a job are 20 to 22 percent less likely to attend secondary or post-secondary education. Being male is associated with a 3 percent lower probability of enrollment after age 12 in urban areas and with an 8 percent higher probability of being enrolled in rural areas” (p. 11). It is also reported that, unlike in primary school, dropout rates are equally as high in poor and non-poor households at the secondary level. Additionally, boys are more likely to dropout than girls, particularly among the poor (Angel-Urdiñola & Laguna, 2008), with the exception of pregnant girls who are 14 times more likely to drop out of school than non-pregnant girls. This results in teenage mothers having 1.8-2.8 fewer years of education than other girls of the same age level (UNESCO, 2012).

Enrollment in technical and vocational programs as a percentage of total enrollments in secondary education (lower and upper secondary combined) is reported in 2010 at 16% of total enrollments. Of these enrollments, 49% were female and 51% were male (Table 5). When looking at upper secondary school alone, typically defined as grades 10-11, enrollment in technical and vocational schools as a percentage of total enrollment increases to 44%, with 49% female and 51% male participation (Table 5). Table 6 shows enrollment in technical education by sector in selected years, including agriculture which was the program with the smallest enrollment.

**Table 6: Enrollment in Technical Education in Selected Years**

Sector	1991	1995	2002	2003	2005	2006
Agriculture and Forestry	2,449	1,648	2,053	2,083	2,655	2,363
Industry and Construction	3,299	2,122	2,712	2,788	3,331	3,311
Commerce and Services	11,211	8,346	8,346	11,740	12,195	12,043
Total	16,959	12,116	12,116	16,611	18,181	17,717

*Reproduced from: Vijil et al., 2007, p. 22. Source: INATEC, 2006*

Enrollment in INATEC has remained level over the past several years while enrollment in secondary schools has increased (Vijil et al., 2007). Porta and Laguna (2007) report that in 2005, enrollments at INATEC corresponding to only 1.6% of the 15-24 year old age group. “This low coverage may be explained by a disregard for the training of technicians on the part of Nicaraguan society and the

lack of policies and incentives promoting technical education and vocational training” (Porta & Laguna, 2007, p. 8). Poor enrollment in INATEC is in part due to insufficient funding to expand INATEC programs, a low perception of technical and vocational training, and a poor regulatory structure that does not promote technical and vocational education (Metzner, 2012; Vijil et al., 2007). It is also notable that significantly more students participate in the commerce and services sector of studies which does not reflect the demands of the labor market. This disconnect is evident when considering that many INATEC graduates have difficulties finding jobs, and that the labor sector is highly dependent on agriculture (Metzner, 2012).

### *Second Chance and Alternative Institutions*

At both the primary and secondary level, Nicaragua has several options for second chance and alternative schooling. Second chance schooling can be defined as opportunities for those who have dropped out of the education system and are returning, such as the adult basic education program in Nicaragua. Alternative schooling can be defined as parallel programs that allow students to attend school with their age cohort, such as in distance education classes. “In more recent years, education opportunities in secondary school have increased through the opening of courses on Saturdays, Sundays and by distance or home learning. This has allowed for bringing young workers into this subsystem” (Vijil et al., 2007, p. 20). Other programs include School Technology Centers (CTEs), tele-secondary programs, radio schools, and Teacher at Home programs (Porta & Laguna, 2007; Singh & Mussot, 2007; USAID, 2012). Porta and Laguna (2007) note however, that geographical areas, funding, and coverage is limited, with 11,145 students participating in some form of flexible education in 2006. This contrasts somewhat with Vijil et al. (2007) who found that in 2006, 26% of students enrolled in secondary school were enrolled in distance or night school. Table 7 includes a partial list of second chance and alternative opportunities.

**Table 7. Second Chance and Alternative Programs**

<b>Program</b>	<b>Description</b>
<b>Primary Education for Overage Children</b>	Students ages 9-15 who are involved in labor
<b>Accelerated Primary Education</b>	Students over 15, includes literacy and secondary school preparation
<b>Applied Secondary Degree/School</b>	Secondary applied diploma for adults who have completed primary school – typically found in rural areas
<b>Secondary Degree Program for Mature Adults</b>	Secondary diploma for adults
<b>Distance Secondary Education</b>	Radio schools, tele-secondary schools
<b>Night School Secondary</b>	Traditional secondary school offered during nights and weekends

*Source: USAID (2009), p. 65; Vijil et al., 2007*

According to Hernandez (2008), MINED works with 78 NGOs on the education of young adults through alternative education. In 2006, this was reported at an enrollment of over 85,000 students with over 6,000 graduating in that same year. MINED reportedly oversees the work of the NGOs including the provision of materials, formal assessments, and pedagogical advice and training. The NGOs fund teachers and facilitators, provide training, and provide teaching materials (Hernandez, 2008).

### *Tertiary Participation*

Recent data on the GER for Nicaragua in tertiary education is unavailable. Data from UNESCO (2008) report that in 2005 Nicaragua was about average at 18% of the total number of eligible-aged students enrolled in tertiary education. Male participation was lower than female participation at 17% which is significantly higher than Guatemala or Honduras. Female participation was on average with the rest of Central America at 19%. Although male participation in tertiary education in Nicaragua was high in comparison to the four Central American countries in Table 8, it still had a gender-parity index that favors female participation at 1.11, indicating significantly less men participating in tertiary education than women. The retention rate in tertiary education was poor with retention rates around 60% in public institutions and 70% in private institutions. The reasons given for dropout include economic



issues, poor quality, family issues, lack of interest, length of studies, lack of instructors, and poor facilities (Olivares, 2011).

**Table 8: Gross enrollment in tertiary education**

Country	Gross enrollment ratio (GER) in tertiary education (%)							
	1999				2005			
	Total	Male	Female	GPI (F/M)	Total	Male	Female	GPI (F/M)
El Salvador	18	16	19	1.25	19	17	21	1.23
Guatemala	...	...	...	...	10	11	8	0.72
Honduras	14	12	16	1.29	16	13	20	1.46
Nicaragua	...	...	...	...	18	17	19	1.11

Source: UNESCO, 2008

## Availability of Agricultural Education

At all three levels of education in Nicaragua agriculture is included in the National Basic Curriculum, though intensive levels of agricultural education are mainly found in specific agricultural sub-systems at the secondary and tertiary levels. While evidence of agricultural education at the primary and secondary level is apparent in Ministry of Education documentation, a comprehensive set of documentation on the National Basic Curriculum was not found. Below is a brief description of the agricultural education programs and their objectives as described in the available documentation.

### *Primary Agricultural Education*

At the primary education level agricultural education occurs during the second cycle, or fifth and sixth grades (MINED, 2009). In the National Basic Curriculum science curriculum as described by a 2009 MINED document, the fifth grade covers basic agricultural concepts with an overall objective to “apply the steps of the scientific method in school projects making appropriate use of the technology available in your environment.” In the sixth grade the science curriculum also covers basic agricultural concepts with the objective to “relate scientific and technological advances with agriculture and livestock, stressing its importance for the development of your community and country” (MINED, 2009).

**Table 8: Agricultural Education Purpose and Competencies in grades 5-6.**

<b>Module</b>	<b>Purpose and Indicators</b>
Program for the Establishment of Tree Nurseries (MINED, 2011a)	<ul style="list-style-type: none"> <li>• <b>Purpose:</b> Establish tree nurseries, applying locally appropriate techniques, standards of safety and occupational hygiene, and protection of the environment.</li> <li>• <b>Indicators:</b> <ol style="list-style-type: none"> <li>Plan the production of nursery plants according to defined objectives.</li> <li>Prepare a nursery based on soil condition, climate, and chosen technologies.</li> <li>Perform nursery management according to species, cultivation requirements, and local conditions.</li> <li>Sell nursery plants at an appropriate price.</li> </ol> </li> </ul>
Program for the Cultivation of Gardens (MINED, 2011b)	<ul style="list-style-type: none"> <li>• <b>Purpose:</b> Produce vegetables by applying locally appropriate agronomic techniques, standards of safety and occupational hygiene, and protection of the environment.</li> <li>• <b>Indicators:</b> <ol style="list-style-type: none"> <li>Produce tomatoes and peppers, applying appropriate agronomic techniques, standards of safety and occupational hygiene, and protection of the environment.</li> <li>Produce cucumber and squash, applying appropriate agronomic techniques, standards of safety and occupational hygiene, and protection of the environment.</li> <li>Produce radishes, onions, carrots, and beets (from multiple species), applying appropriate agronomic techniques, standards of safety and occupational hygiene, and protection of the environment.</li> <li>Produce cabbage, broccoli and spinach, applying appropriate agronomic techniques, standards of safety and occupational hygiene, and protection of the environment.</li> </ol> </li> </ul>
Program of Basic Grains (MINED, 2011c)	<ul style="list-style-type: none"> <li>• <b>Purpose:</b> Produce basic grains for market and personal consumption by applying locally appropriate agronomic techniques, standards of safety and occupational hygiene, and protection of the environment.</li> <li>• <b>Indicators:</b> <ol style="list-style-type: none"> <li>Produce maize by applying locally appropriate agronomic techniques, standards of safety and occupational hygiene, and protection of the environment.</li> <li>Produce beans by applying locally appropriate agronomic techniques, standards of safety and occupational hygiene, and protection of the environment.</li> <li>Produce sorghum by applying locally appropriate agronomic techniques, standards of safety and occupational hygiene, and protection of the environment.</li> <li>Produce rice by applying locally appropriate agronomic techniques, standards of safety and occupational hygiene, and protection of the environment.</li> </ol> </li> </ul>

During the second cycle of primary education there is a focus on productive work skills including training modules on reforestation and tree nurseries, household gardening, and basic grains. These training modules are intended to provide students with the “knowledge, abilities, skills, attitudes, and aptitudes to incorporate into productive work, in order to improving their level of life and that of their family, and to contribute to the development of the country” (MINED, 2011a; 2011b; 2011c). The overall purpose and indicators for some of these programs are listed in Table 8.

### *Secondary and Vocational Agricultural Education*

The available documentation on curriculum in secondary education establishes agricultural education as a track in academic vocational training as provided by MINED and as a technical training program from INATEC, with some training modules in coordination (MINED, 2011d). MINED training modules in farming and forestry include animal nutrition, animal sanitation, agribusiness, fruits and gardens, and dairy production (MINED, 2011d; 2011e; 2011f; 2011g; 2011h). These programs have the goal to train students in order to “participate and contribute to rural development to strengthening the agricultural sector, improve the yield of milk and meat production, in the context of food sovereignty and food security” (MINED, 2011d; 2011e; 2011f; 2011g; 2011h). The overall purpose and indicators for some of these programs are listed in Table 9.

INATEC offers agricultural training programs as part of their technical and vocational tracks. While a comprehensive curriculum was not found, the 2011 plan of courses for a technical diploma in farming and several associated modules were available. According to this plan, there are four levels of training for the farming technical degree. At the first level 120 hours of training in basic computing, human relations, technical writing, and business management (INATEC, 2011). After completing this coursework student’s move on to 810 hours of training to complete a technical diploma as a plant technician. This includes coursework in plant physiology, plant health, mechanization of agriculture, conservation of soils and water, agroforestry, plant nurseries, agro-industrial cultivation, gardening, and fruits. Students can then continue on to another technical diploma as an animal. This level includes 700 hours of training in animal anatomy and physiology, animal reproduction, animal sanitation, pasture and forage, animal nutrition, major and minor farming infrastructure, and planning for farm production. Another 380 hours after this level and a 3-6 month internship will yield a full diploma as a farming technician for a total of 2,010 hours of coursework (INATEC, 2011).

**Table 9: Agricultural Education Purpose and Competencies in MINED training.**

<b>Module</b>	<b>Purpose and Indicators</b>
Animal Nutrition (MINED, 2011d)	<ul style="list-style-type: none"> <li>• <b>Purpose:</b> Apply the basic principles, rules, and procedures for the feeding of livestock with appropriate amounts of energy and protein needs through critical thinking, responsibility, environmental approaches, and complying with standards of hygiene and occupational safety.</li> <li>• <b>Indicators:</b> <ol style="list-style-type: none"> <li>I. Provide sufficient pasture and forage in beef cattle feed to provide proper nutrition, taking into account the characteristics of inputs, and with technical criteria.</li> <li>II. Provide food for the dry season, according to rules and procedures, in order to meet the nutritional needs of cattle and to prevent disease.</li> </ol> </li> </ul>
Animal Sanitation (MINED, 2011e)	<ul style="list-style-type: none"> <li>• <b>Purpose:</b> Develop skills for good health management and preventative and curative handling of livestock, applying appropriate techniques for diagnosis and control, prevention, and treatment of diseases through drugs and sanitary measures in compliance with standards of occupational safety and efficient environmental protection.</li> <li>• <b>Indicators:</b> <ol style="list-style-type: none"> <li>I. Use different techniques of restraint, immobilization, and slaughter of cattle.</li> <li>II. Efficiently manage the diseases that affect animals through clinical diagnosis.</li> <li>III. Use equipment and sanitary materials for the prevention and cure of animals.</li> <li>IV. Administer preventative and curative medicines to cattle.</li> <li>V. Develop and manage a health calendar for cattle.</li> </ol> </li> </ul>
Agribusiness (MINED, 2011f)	<ul style="list-style-type: none"> <li>• <b>Purpose:</b> Perform efficiently the management of an agribusiness acquiring the tools necessary to perform quality procedures that take into account all of the necessary technical procedures for implementation in the rural sector through community projects.</li> <li>• <b>Indicators:</b> <ol style="list-style-type: none"> <li>I. Understand the vision and concepts of agribusinesses, and their importance in relation to markets and the commercialization of agriculture.</li> <li>II. Apply a plan for marketing and production as a basic instrument to minimize risk associated with production and the competitive distribution of a product in a market.</li> <li>III. Apply distinct options for the organization of Rules of Business with distinct commercial contacts, export markets, and rural business associations, in order to obtain finances.</li> <li>IV. Value the importance of partnerships as a strategy to improve competitiveness, recognizing that there are different mechanisms that facilitate its application adapted to the characteristics of the rural sector.</li> </ol> </li> </ul>
Fruit and Vegetable Processing (MINED, 2011g)	<ul style="list-style-type: none"> <li>• <b>Purpose:</b> Process fruits and vegetables contributing to the food security of your community or region, applying tools, norms of quality, standards of hygiene, environmental protection, and commercialization of products.</li> <li>• <b>Indicators:</b> <ol style="list-style-type: none"> <li>I. Process and commercialize diverse fruit and vegetable products applying process to ensure safety (hazard free food that does not cause danger) with conservation techniques, proper use of ingredients, equipment, and safety hygiene, and environmental protection measures.</li> </ol> </li> </ul>
Dairy Production (MINED, 2011h)	<ul style="list-style-type: none"> <li>• <b>Purpose:</b> Produce and sell different types of dairy products, applying norms for safety, hygiene, occupational protection, and the protection of the environment in your community.</li> <li>• <b>Indicators:</b> <ol style="list-style-type: none"> <li>I. Determine and preserve the quality of crude milk, applying norms for food safety, occupational hygiene, and vigilance and protection of the environment.</li> <li>II. Process different types of derivatives of dairy, applying technical food safety norms, occupational hygiene, and protection of the environment.</li> <li>III. Establish small processing units for the production of dairy according to safety norms, occupational hygiene, and protection of the environment.</li> </ol> </li> </ul>

### *Tertiary Agricultural Education*

An initial investigation of the higher education institutions in Nicaragua reveal that there are currently three public and nine private institutions that offer agricultural programs at varying levels. (Table 10). All 12 of these universities offer agricultural programs at the licenciatura or engineering levels (3-4 year collegiate degree). At the master's and doctorate level, the National Agrarian University (UNA) is the only institution offering graduate education in agriculture.

### **Barriers to Access and Gaps in Education**

The transition rate from primary school to secondary school is poor with half of students not continuing on with secondary education, and with less than 30% of students who enter secondary school graduating (Hill, 2013). Alarming, 20% of children who are not enrolled in primary school state that they would not be interested in returning. However, 50% of students, particularly those in indigenous groups and agricultural households, claim they would return to school if school costs, including informal costs such as books, were not required (Angel-Urdiñola & Laguna, 2008). There are a myriad of barriers facing the education system in Nicaragua ranging from poor infrastructure, poorly qualified teachers, lack of access, over-crowding, low quality, costs, lack of interest, and a high level of employed children and youth.

Lack of access to schools and an insufficient number of teachers are significant barriers to education (Hill, 2013). The long distances to schools, particularly in rural areas, is listed among the primary reasons why children in the Central and Atlantic regions are not attending school (Angel-Urdiñola & Laguna, 2008). In Nicaragua specifically, distance to schools and a lack of school facilities are cited as the biggest barriers to participation among both urban and rural poor, and among families engaged in agriculture (Angel-Urdiñola & Laguna, 2008; Kraft et al., 2009).

**Table 10: Institutes of Higher Education that offer Agricultural Programs**

Public Institutions of Higher Education		Agricultural Programs
1	<a href="#">National Agrarian University</a> Universidad Nacional Agraria (UNA)	<ul style="list-style-type: none"> <li>Licenciatura               <ol style="list-style-type: none"> <li>Agribusiness</li> <li>Rural Development</li> <li>Agronomy Engineering</li> </ol> </li> <li>Engineering Diploma               <ol style="list-style-type: none"> <li>Agricultural Engineering for Sustainable Development</li> <li>Engineering for Systems of Protection of Agriculture and Forests</li> </ol> </li> <li>Master's Degree               <ol style="list-style-type: none"> <li>Management and Conservation of Renewable Natural Resources</li> </ol> </li> <li>Doctorate Degree               <ol style="list-style-type: none"> <li>Agroecology</li> </ol> </li> </ul>
2	<a href="#">National Autonomous University of Nicaragua-León</a> Universidad Nacional Autónoma de Nicaragua-León (UNAN-León)	<ul style="list-style-type: none"> <li>Engineering Diploma               <ol style="list-style-type: none"> <li>Aquaculture Engineering</li> <li>Tropical Agroecology Engineering</li> </ol> </li> </ul>
3	<a href="#">University of the Autonomous Regions of the Nicaraguan Caribbean Coast</a> Universidad de las Regiones Autónomas de la Costa Caribe Nicaragüense (URACCAN)	<p><i>Bluefields:</i></p> <ul style="list-style-type: none"> <li>Engineering Diploma               <ol style="list-style-type: none"> <li>Agroforest Engineering</li> </ol> </li> </ul> <p><i>BILWI:</i></p> <ul style="list-style-type: none"> <li>Engineering Diploma               <ol style="list-style-type: none"> <li>Agroforest Engineering</li> </ol> </li> </ul> <p><i>Nueva Guinea:</i></p> <ul style="list-style-type: none"> <li>Engineering Diploma               <ol style="list-style-type: none"> <li>Agroforest Engineering</li> </ol> </li> </ul> <p><i>Las Minas:</i></p> <ul style="list-style-type: none"> <li>Engineering Diploma               <ol style="list-style-type: none"> <li>Agroforest Engineering</li> </ol> </li> </ul>
Private Institutions of Higher Education		Agricultural Programs
1	<a href="#">Catholic University of Dry Tropic Farming and Livestock</a> Universidad Católica Agropecuaria del Trópico Seco: UCATSE	<ul style="list-style-type: none"> <li>Engineering Diploma               <ol style="list-style-type: none"> <li>Agricultural Engineering</li> </ol> </li> </ul>
2	<a href="#">Central American University</a> Universidad Centroamericana (UCA)	<ul style="list-style-type: none"> <li>Professional Development Courses in:               <ol style="list-style-type: none"> <li>Development of Local Food Agriculture Systems</li> <li>Water Management in Nicaragua</li> </ol> </li> </ul>
3	<a href="#">Christian Autonomous University of Nicaragua</a> Universidad Cristiana Autónoma de Nicaragua (UCAN)	<ul style="list-style-type: none"> <li>Engineering Diploma               <ol style="list-style-type: none"> <li>Agricultural Engineering</li> </ol> </li> </ul>
4	<a href="#">International School of Agriculture and Livestock</a> Escuela Internacional de Agricultura y Ganadería (EIAG)	<ul style="list-style-type: none"> <li>Engineering Diploma               <ol style="list-style-type: none"> <li>Agronomy Engineering</li> <li>Agricultural Technician</li> </ol> </li> </ul>
5	<a href="#">Paulo Freire University</a> Universidad Paulo Freire (UPF)	<ul style="list-style-type: none"> <li>Engineering Diploma               <ol style="list-style-type: none"> <li>Multipurpose Agricultural Engineering</li> </ol> </li> <li>Technical Diploma               <ol style="list-style-type: none"> <li>Administration in Applied Agroforestry</li> <li>Agroforestry</li> </ol> </li> </ul>
6	<a href="#">Popular University of Nicaragua</a> Universidad Popular de Nicaragua (UPONIC)	<ul style="list-style-type: none"> <li>Engineering Diploma               <ol style="list-style-type: none"> <li>Engineering in Agrarian Science</li> </ol> </li> </ul>
7	<a href="#">Spanish-American University</a> Universidad Hispanoamericana (UHISPAM)	<ul style="list-style-type: none"> <li>Licenciatura               <ol style="list-style-type: none"> <li>Agribusiness Administration</li> <li>Agricultural Management for Small and Medium-Sized Producers</li> </ol> </li> </ul>
8	<a href="#">University of Chinandega</a> Universidad de Chinandega (UACH)	<ul style="list-style-type: none"> <li>Engineering Diploma               <ol style="list-style-type: none"> <li>Agricultural Engineering</li> </ol> </li> </ul>
9	<a href="#">University of Northern Nicaragua</a> Universidad del Norte de Nicaragua (UNN)	<ul style="list-style-type: none"> <li>Engineering Diploma               <ol style="list-style-type: none"> <li>Agricultural Production Systems Engineering</li> </ol> </li> </ul>

In addition to a lack of access to schools, infrastructure issues abound including 65% of urban schools without a library, 99% with no laboratory or science facilities, 91% with no computers, 50% without potable water, 75% without drainage systems, and 57% without electricity. For rural schools the situation is more severe including 68% without electricity, 60% without potable water, 85% without drainage systems, no computers, and no science laboratories or facilities (Näslund-Hadley et al., 2012). Similarly, few schools have adequate books with Näslund-Hadley et al. (2012) reporting that in the third grade students on average have access to only 0.8 books per student, and students in the sixth grade have access to even fewer at 0.5 books per student. This is compared to an average in Latin America of three books per student. At the secondary level it is estimated that one in five students do not have access to books (Angel-Urdiñola & Laguna, 2008).

Economic barriers are significant between upper and lower quintiles as well as between regions and urban and rural areas. “Analysis of poverty in Nicaragua emphasizes the welfare gains from education: non-poor households have higher levels of educational attainment than poor ones (especially in post-primary education), and welfare gains have been associated with higher educational attainment” (Angel-Urdiñola & Laguna, 2008, p. 1). There are 16 percentage points difference between students in the highest and lowest quartiles in primary school enrollment and only three out of every ten students in the poorest quintile complete primary school education as compared to eight of every ten in the richest quintile. This gap increases significantly in the secondary level where 78% of students in the wealthiest quintile are enrolled as compared to 48% of the poorest quintile (Näslund-Hadley et al., 2012). “Controlling for other factors, socio economic condition (proxied by the household consumption quintile) constitutes an important determinant affecting children’s probability of being at school after age 12” (Angel-Urdiñola & Laguna, 2008, p. 11).

School costs are a significant issue, which in addition to lack of access are cited as the primary reason why children ages 7-12 are not enrolled in primary school (Angel-Urdiñola & Laguna, 2008). In

richer households, school fees are associated with the cost of sending students to private school. "...while less than 1 percent of the overall costs paid by households in the bottom quintile for their children who attend primary school are related to tuitions, the same proportion is at 60 percent for households in the highest quintile" (Angel-Urriola, 2008, p. 20). In public primary schools in 2005 the cost of education was equivalent to 22% of the extreme poverty line (Porta & Laguna, 2007). Hidden school costs such as uniforms, school supplies, transport, and books are a burden particularly for the poor where these costs make up a large proportion of the household income (Porta & Laguna, 2007; Angel-Urriola & Laguna, 2008; Kraft et al., 2009). Lack of interest is a significant issue at all levels of education. At the primary level, in 2005 22.3% of urban primary-aged out-of-school students cited lack of interest as their primary reason for not attending, which was an increase from 14% in 2001 (Angel-Urriola & Laguna, 2008).

Water and sanitation issues are a significant barrier, particularly in rural schools. For example, a UNICEF evaluation of 25 Nicaraguan primary schools targeted for their Child Friendly Schools program, finds only 25% of the schools visited had hand washing facilities near food preparation sites, 47% had functioning sinks close to latrines, and that "Although the situation seems to have improved dramatically over the past few years, with wells being provided to schools, it seemed that when these wells became contaminated or needed repairs, the schools were left with a problem that they did not have the means to resolve" (Spier et al., 2009, p. 35). This same report identified physical safety as an issue with 26% of students feeling unsafe walking to and from school, and reported a lack of wholesome school nutrition as a continuing issue.

Child labor and youth employment in Nicaragua is possibly one of the most significant barriers to education at both the primary and secondary level. Porta and Laguna (2007) note the impact of this situation on participation in education stating: "it is important to emphasize that, because child labor is a reality in Nicaragua, there is an opportunity cost when it comes to the use of time since going to



school rules out going to work” (p.20). Zabaleta (2011) notes that 10% of children between 5-14 years of age are involved in work, which increases to 14.4% among boys. Participation in labor reduces the likeliness that a student will finish school or return to school once they have dropped out. (Zabaleta, 2011). Work and financial issues are cited as the most significant barriers to secondary education.

“About 30 percent of all individuals (poor and non-poor) claim to be out of school because they need to work; about 25 to 30 percent (at all socio-economic levels) claim that lack of money is the main reason keeping them away from school; and about 16 to 20 percent (a considerable share) claim that they are not interested to be at school. Other reasons, such as family problems, pregnancy, and child care add up to about 12 percent” (Angel-Urdiñola & Laguna, 2008).

While 13 out of every 100 out-of-school secondary aged girls claim that financial and work pressures keep them from schooling, out-of-school boys cite lack of interest and work constraints as the two main issues keeping them from school. This includes 42 out of every 100 out-of-school boys. For girls, the more predominant issue is domestic responsibilities, pregnancy, and childcare restraints which affect 34 out of every 100 girls (Angel-Urdiñola & Laguna, 2008).

Teacher training, quality, and salary are significant issues at all levels of the Nicaraguan school system. Given Nicaragua’s level of development, they have the lowest qualified teachers with the lowest share of trained teachers in Latin America, particularly in secondary education (Di Gropello, 2005b; Hill, 2013; Kraft et al., 2009). “Data suggest that 25 of every 100 of teachers in primary are not properly trained to teach, whereas the same proportion reaches more than 50 percent in secondary” (Angel-Urdiñola & Laguna, 2008). Overall, 18% of Nicaraguan teachers have only a primary school education, most of who serve in rural areas. Only 14% of Nicaraguan teachers had a higher education degree in 2005 (Di Gropello, 2005b; Hill, 2013). USAID (2009) puts these numbers even higher at 30% of primary and 58% of secondary teachers untrained. It should be noted that Nicaragua has the highest teacher-student ratio in Latin America with an average of 33 students per teacher rising up to more than 60 per teacher in Managua (Kraft et al., 2009).

The low levels of training of teachers is apparent in the teaching methodologies and styles where teachers rely on passive and traditional teaching methods such as lecture, repetition, and rote-memorization (Di Gropello, 2005b). It is reported that as many as 27% of teachers in Nicaragua have not received training before teaching – a trend that has increased in recent years (Hill, 2013). This is worrisome both in the quality of education provided to students, and in retention of teachers where “research has confirmed that high rates of attrition from teaching are often a function of inadequate preparation and support in the early years” (Hill, 2013, p. 7). According to Porta and Laguna (2007), teachers have a poor understanding of the subjects they teaching stating that only 47% of teachers claim to have a good command of third grade geometry, and only 39% fully understand sixth grade probability mathematics.

Teacher salaries are a particular issue. For example, the typical primary school salary in 2005 was 1,300 Cordobas per month (equivalent to approximately \$85 dollars in 2005) which is less than the minimum amount required for a “basket of goods” at 2,540 Cordobas (\$166 dollars) (Hernandez, 2008). This amount is after significant efforts at raising teacher salaries. USAID (2009) notes that: “significant progress had been made over recent years, raising average salaries from approximately \$65 per month, among the lowest in the world, to \$157, a 128% rise, but still leaving them among the poorest paid teachers in the world” (p. 32).

The lack of available quality teachers is in part attributed to this issue there the teaching salary is considered to be less than a living wage and many teachers take second jobs to support themselves (Bernheim, 2008; Hill, 2013; Näslund-Hadley et al., 2012). The ASP program was designed to improve this situation with the idea that school fees would supplement the MINED teacher salary, however these increases do not appear to have materialized and Nicaraguan teachers still have the lowest salary in Central America (Gillies, 2010; Hill, 2013; Näslund-Hadley et al., 2012). Nicaragua has introduced salary

incentives to encourage qualified teachers to work in disadvantaged areas, however the effectiveness of this strategy has not been assessed (Di Gropello, 2005b).

With the challenges facing the Nicaraguan school system it is unsurprising that the quality of education is considered poor at all levels of education. The perception of the quality of education is low with 20-25% of parents perceiving primary education as of poor quality (Angel-Urdiñola & Laguna, 2008). This perception does vary across groups with “households in the poorest quintiles less likely to rate their children’s education as excellent as compared to households in the highest quintiles. Indigenous households and those engaged in agriculture are less likely to rate their children’s education as excellent and more likely to rate it as regular or bad. Finally, households in Managua and in urban areas are more like to consider that their children’s education is excellent as compared to those in other regions.” (Angel-Urdiñola & Laguna, 2008, p. 36).

The low perception of quality is reflected in student performance where less than 14% of students in the third and sixth grade are proficient in the curriculum in 2002. MINED reports state that 60-90% of students in the third and sixth grade have a below expected mathematics and Spanish scores (Angel-Urdiñola & Laguna, 2008; Carrasco, 2009). In this same period, it was found by the Second Regional Comparative and Explanatory Study (SERCE), which tests students on various subjects, that from the 15 Latin American countries examined, Nicaragua had the lowest scores in math and language in the third grade, and the lowest score in math in the sixth grade (Näslund-Hadley et al., 2012). This situation remained the same in 2004 with USAID noting that only 2 out of 144 groups of students had achieved minimum learning outcomes in Spanish and Mathematics in both the third and sixth grades.

“It is particularly frightening to see the mathematics result at grade 6, where 85-90% of all students, regardless of type of school were below minimums. This is true, despite the fact that large numbers of children have already exited the system by grade 6, leaving only the ‘best’ students. In other words, the figure is an evidence that Nicaraguan primary education is faced with massive ‘system failure’” (Kraft et al., 2009, p. 32).

This situation becomes worse at the secondary level where students are already entering the system at low levels of mastery.

### *Gender Barriers*

At the primary school level, participation between boys and girls is relatively equal. However, when looking regionally, disparities begin to appear. In the North Atlantic Autonomous Region, the departments of Nueva Segovia and Jinotega have fewer girls attending school than boys (Porta & Laguna, 2007). At the secondary level and tertiary levels, similarly to some other Latin American countries, fewer boys are completing school than girls. A large proportion of boys who drop out of the education system are entering the work force which is particularly of issue in rural areas (Porta & Laguna, 2007). The need to work and a lack of money are cited as the reason why students left the secondary school system 68% of the time (Kraft et al., 2009).

The gender parity index that favors female students in Nicaragua, as well as in some other Central American countries, can in part be explained by an increasing perception of education as a “feminine” pursuit leading to peer-pressure for boys to drop out of school (Jha, Bakshi, and Faria, 2012b). This exacerbates issues of underachievement that have been attributed to gang and street culture. High incidence of crime, drug abuse, narcotics trafficking, violence, and some of the highest murder rates in the world are in part attributed to boys’ disadvantage in education. “Although it is difficult to establish direct and definite linkages, engagement in youth violence, easy access to guns and drug related job opportunities appear to be both a cause and impact of boys’ disadvantage in education” (Jha et al., 2012b, p. 6).

Overall, boys are at a disadvantage to girls in the Nicaraguan education system, with the exception of INATEC’s vocational and technical programs. INATEC includes gender as a cross-cutting issue in its overall plan and includes a program titled “Women, Gender, and Development” in order to

“promote the participation of women in professional education and technical as well as non-traditional training with a gender approach and a view toward insertion to the labor market under equal conditions” (Vijil et al., 2007, p. 42. INATEC, 2006). However, Vijil et al. report that as of 2007 there was little evidence that this program has had any impact, stating:

“There persists a gender bias in the selection of technical professional training courses and occupations: the men concentrate on specialties in the agriculture, forestry, industry and construction sectors, while women choose specialties in trade and services. This is in large measure explained by the strong cultural patterns regarding what activities ‘should’ be carried out by women and which by men” (Vijl, 2007, p. 42).

It is notable that where when women have been trained in INATEC fields historically held by men, they have had difficulties in finding employment. In 2006, INATEC enrollment numbers show 85% of women were enrolled in short-term technical programs over longer-term diploma programs, and that only 15% of women were enrolled in technical training courses. Of the total women enrolled in INATEC in the year under study, 81% were in trade and service programs, 17% were in industry and construction, and the remaining 2% were in agriculture and forestry fields (Vijil et al., 2007). Factors that prevent women from finishing INATEC programs include early pregnancy, economic difficulties, and domestic responsibilities, and being single mothers (Vijil et al., 2007).

#### *INATEC barriers*

As the primary institution for the provision of technical and vocational education, and with a regulatory and financial structure that is not responsive to the needs of the institution, INATEC faces significant barriers in coverage, retention, and quality of education. Such issues begin with an issue of the low perception of vocational training in Nicaragua. “...society at large does not acknowledge a technical education in social and economic terms. This undoubtedly contributes to the lack of interest in coordination on the matter among public and private entities” (Vijil et al., 2007, p. 8). This is particularly an issue in the private sector where a technical degree is considered inferior to a university degree.

Interestingly, this results in university graduates being employed over vocational and technical school graduates, even when the university graduate is overqualified for the job.

INATEC also faces many of the same barriers as the secondary education system including poor teaching methodologies, insufficient skills delivery, lack of practicality, lack of adequate equipment, low retention of teachers, and a disconnect between the INATEC programs and the demands of the labor market. The latter issue is a particular problem with stakeholders in industry stating that graduates are unable to use technologically advanced equipment and that the practical aspect of INATEC training is insufficient (Vijil et al., 2007).

#### *Tertiary Education Barriers*

Many of the issues facing the secondary school system are echoed in the tertiary system including poorly trained and paid teachers, poor administrative and financial management, poor infrastructure, lack of relevance, lack of coordination with the secondary school systems and with the demands of the labor force, and lack of oversight and regulation in both public and private institutions (Bernheim, 2008; Olivares, 2011). There are many problems facing students as they transition from secondary to tertiary education. Bernheim (2008a) outlines four factors that significantly limit students' abilities to participate successfully in higher education including poor preparation, lack of sequence and continuity, lack of study and self-learning skills, and poor evaluation of student aptitude. This latter point is further illustrated by a lack of nationalized exams or minimum standards for admission. Each institution sets its own requirements for admission which results in issues such as private schools accepting any student who can pay tuition (Bernheim, 2008).

There are few science and technology programs in Nicaragua. At the higher education level, the cost of schooling is a significant barrier with tuition unaffordable for the poor or middle class, and with

little or no students from the poorest quintiles attending school at the university level (Angel-Urriñola & Laguna, 2008; Sanyal, 2009).

### *Impact of Barriers to Education*

The poor enrollment, retention, and graduation rates in Nicaragua have significant impacts on literacy, job skills, and participation in the labor force. This is compounded by a mismatch between technical and vocational, secondary, and tertiary level graduates whose skills are not demanded by the labor market. Interestingly, many secondary school graduates emigrate to work outside of Nicaragua with the emigrated population averaging a higher school level than those who remain. The results of remittances from emigrated Nicaraguans, who make up 10% of the Nicaraguan population, are estimated at 20% of the total GDP. Other impacts include a shrinking of contracted jobs and labor organizations, and a growing informal labor sector. Agriculture, while considered the least dynamic sector in Nicaragua, continues to absorb the workforce making it an important part of the Nicaraguan economy (Vijil et al., 2007). A detailed look at the economy of Nicaragua is included in the tables found in Appendix B.

## Youth Development and the Caribbean Coast

Youth Development is a priority focus in many development agencies and for the Nicaraguan government due to the large gap in education and the high number of youth in the country. This is particularly relevant along the Caribbean Coast where only two out of every ten school-aged students are enrolled in secondary school in the first year, dropping to one out of every ten in the second year (USAID, 2012). This area also has the highest dropout rates in primary school estimated at 17% in RAAS and 17.5% in RAAN. Metzner (2012) attributes this in part to large discrepancies in funding from MINED which provides the RAAN and RAAS school systems with a disproportionately small amount of funding in

comparison with their population than other school systems. “The few job opportunities and low levels of schooling, together with the high school drop-out rates, by themselves place the large majority of the youth population of the region in a situation of high vulnerability and risk” (USAID, 2012, p. 9).

In addition to poor funding structures, the Caribbean Coast is suffering from higher levels of poverty, increasing violence from the narcotrafficking trade, inter-ethnic tension, and high levels of drug use. Other barriers to education include poverty, domestic violence, and migration of parents. All of this occurring with the highest proportion of the youth population in the country at approximately 65% of the area’s population (USAID, 2012).

As noted above, the narcotrafficking and gang violence is having a dramatic impact on the youth in Nicaragua, particularly along the Caribbean Coast. A USAID (2012) study in this region including the interviews of 100 people have found that the drug trafficking issues are the major catalyst of problems in the region including drug use, violent crime, the disintegration of family and social structures, and more. Participation in these issues is predominately occurring among young men, though 10% of arrests in the area are of young women including for issues of prostitution linked to the other violence occurring. Young women are often victims of domestic and sexual abuse, which is exacerbated by low levels of education that prevent any bargaining power.

## Recommendations

Based on a literature review of the Nicaraguan educational system, the following recommendations for building the capacity of Nicaraguan agricultural and education training systems are worthy of consideration and further exploration:

### *All levels*

- Improve existing infrastructure and increase facilities.



- Improve efficiency in public investment in education, particularly for the poor and rural populations.
- Improve teacher salaries and teacher training programs particularly for teachers working in rural areas.
- Create teacher recruitment and retention programs.
- Improve teaching methods, practices, and biases to improve the repetition and dropout rate – particularly among boys.
- Upgrade curriculum and teaching practices by placing less emphasis on theoretical models and more on practical application.
- Ensure that the agricultural curriculum is relevant to societal needs would ensure that agriculture and provides students with the necessary skill sets to be successful in the labor market.
- More research and discussion of the issues surrounding youth participation in gang and narcotrafficking activities, their effects on educational participation, and in particular the impact on poor and rural boys, is needed.

#### *Primary Education*

- Create incentive programs and poverty alleviation programs aimed at ensuring both boys and girls have access to education and reduce the need for dropout due to socioeconomic needs (such as Conditional Cash Transfer programs). This is of particular importance in addressing informal school costs and opportunity costs for child laborers.
- Implement early inclusion of agriculture courses to stimulate students' interest in agriculture.
- Ensure that agriculture is presented to girls as well as boys as an option for employment in both school curriculum and in teaching methods.

#### *Secondary Education*

- Strengthen the capacity of INATEC to provide agricultural vocational classes for both short and long-term training programs.

- Improve the efficacy of INATEC training programs through improved funding mechanisms, public/private partnerships with agricultural industries, improved teaching methodologies, and better trained and paid instructors.
- Provide role models, programs, and incentives to encourage female students to pursue agricultural education.
- Collaborate with institutions and firms in the labor market to create an agricultural curriculum that is relevant to the needs of the sector.

#### *Second Chance and Alternative Secondary Education*

- Increase the coverage and funding for alternative secondary education, particularly for programs that have paid teachers and that offer the national basic curriculum.
- Increase the availability of alternative secondary education programs that offer an agricultural vocational focus.
- Create and implement a standardized curriculum for agricultural education in alternative secondary schools.

#### *Tertiary Education*

- Increase availability of tertiary level agricultural education institutions and increase the capacity of existing institutions.
- Explore new and innovative ways of funding institutions make agriculture institutions sustainable and accessible to students from poorer backgrounds.
- Collaborate with institutions and firms in the labor market to create an agricultural curriculum that is relevant to the needs of the sector.
- Increase opportunities for relevant agricultural field practice, internships, and research.

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## Appendix B: Economic Outlook: Data and Statistics

### Population Demographics

The population of Honduras is experiencing a youth bulge with the highest percentage of the society under the age of 24, at a total of 51.7% of the population. Table 1 demonstrates the breakdown by age including by percentage of female and male. Notable, the female proportion is significantly greater than the male in the population aged 25 and older.

**Appendix B Table 1: Current Population (2014)**

Age	% of Total	Total M	Total F	% M	% F	Population Pyramid	
0-14 years	29.3	873,545	839,853	51	49		
15-24 years	22.4	657,076	652,856	50	50		
25-54 years	38	1,051,656	1,173,084	47	53		
55-64 years	5.4	147,405	169,618	46	54		
65+ years	4.7	127,699	155,849	45	55		
Total Population		5,848,641					

CIA, 2014.

Population Pyramid Reproduced: CIA, 2014

### Key Economic Sectors

The tables found in this section illustrate income and employment in terms of the key economic sectors. Table 2 illustrates the current GDP in USD and the annual percentage growth for the years 2009-2013, the per capita GDP and growth, and the PPP in current (2014) international dollars.

**Appendix B Table 2: GDP and PPP**

GDP & PPP					
	2009	2010	2011	2012	2013
GDP (current USD)	8,380,736,990	8,938,210,560	9,898,547,558	10,644,973,606	11,255,642,565
GDP growth (annual %)	-2.759	3.309	7.326	3.355	4.606
GDP per capita (current USD)	1459.21	1535.19	1676.26	1776.61	1851.11
GDP per capita growth (annual %)	-4.035	1.903	5.819	1.861	3.0793
PPP (current international \$)	21,752,206,798	22,742,656,846	24,888,132,267	26,172,777,046	27,792,848,666
PPP per capita (current international \$)	3787.39	3906.19	4214.65	4368.15	4570.83

World Bank, 2014.

Table 3 shows the share of income for each quintile. Also included is the income share for the lowest and highest 10% of the population. The years shown are the years for which data are available. Most notable, while the share of income increased for the lowest three quintiles (Q1-Q3) increased consistently from 1993-2005. However, in 2009 the share of income for these quintiles decreased while the share of income for the highest two quintiles (Q4-Q5) increased.

**Appendix B Table 3: Share of Income**

Share of Income (%)					
	1993	1998	2001	2005	2009
Income share lowest 10%	0.49	2.18	2.3	2.61	1.61
Income share lowest 20% (Q1)	2.13	5.35	5.63	6.22	4.64
Income share second 20% (Q2)	6.42	9.31	9.75	10.21	9.26
Income share third 20% (Q3)	11.19	13.78	14.33	14.79	13.97
Income share fourth 20% (Q4)	19.72	20.38	21.02	21.54	21.13
Income share highest 20% (Q5)	60.54	51.18	49.27	47.24	51.06
Income share highest 10%	44.16	36.12	33.87	31.51	35.19

World Bank, 2014.

In the years 2008-2012 the dollar contribution to GDP in each sector has increased yearly, with the exception of the Service sector between the years 2008-2009. The percentage contribution to GDP is the greatest in the Service industry at 53.48% in 2012.

**Appendix B Table 4: GDP by Sector**

	Contribution to GDP (2014 USD) (000,000,000)					% of GDP				
	2008	2009	2010	2011	2012	2008	2009	2010	2011	2012
Agriculture	1.344	1.311	1.508	1.730	1.913	17.37	17.12	18.56	19.29	19.9
Manufacturing	1.150	1.177	1.227	1.464	1.572	14.86	15.36	15.1	16.33	16.35
Industry	1.734	1.740	1.856	2.286	2.559	22.4	22.7	22.86	25.49	26.62
Service	4.659	4.611	4.760	4.953	5.140	60.22	60.17	58.59	55.22	53.48

World Bank, 2014.

The years 2008-2009 showed a decrease in growth by sector in every sector. The year 2010 showed a significant increase in growth with the agriculture and manufacturing industries showing growth greater than the previous year's decrease. From 2010-2011 agriculture decreased in growth while manufacturing, industry, and service increased. In 2012 there was a decrease in all four sectors with service showing a significant decrease in growth.

**Appendix B Table 5: Growth by Sector**

	Growth by Sector (% annual growth)				
	2008	2009	2010	2011	2012
Agriculture	4.360	-1.373	9.823	4.328	1.0457
Manufacturing	-2.843	-2.369	6.125	6.653	4.973
Industry	0.413	-4.738	4.224	9.518	9.402
Service	3.334	-2.427	1.154	6.691	0.955

World Bank, 2014.



Table 6 shows exports for each sector including the contribution by merchandise, commercial, and technology sectors. Exports of goods and services including current USD, percentage of GDP, and percent growth is shown for the years 2009-2013. Notably, growth declined significantly from the year 2012-2013.

**Appendix B Table 6: Exports by Sector**

Exports by Sector					
	2009	2010	2011	2012	2013
Merchandise exports (current USD)	1,393,800,000	1,851,100,000	2,264,000,000	2,677,400,000	...
Commercial service exports (current USD)	563,200,000	605,900,000	686,100,000	759,800,000	...
High technology exports (current USD)	6,761,103	5,592,320	5,994,074	5,756,146	...
Exports of goods & services (current USD)	2,589,149,192	321,023,2062	3,965,474,954	4,581,533,718	4,560,527,125
Exports of goods & services (% of GDP)	30.894	35.916	40.0612	43.039	40.5178
Exports of goods & services (% growth)	0.802	12.201	8.045	13.429	3.144
Export volume index (2000 = 100)	1,393,800,000	1,851,100,000	2,264,000,000	2,677,400,000	...

World Bank, 2014.

## Labor Market Statistics

The tables found in this section illustrate the key employment demographics in Nicaragua. This includes information on labor market participation and unemployment. Table 7 shows the percentage of unemployment broken down by age and level of education for the years 2004-2008 and the year 2010.

**Appendix B Table 7: Employment by Educational Attainment**

	2004			2005			2006			2008			2010		
	% of Total	% of Male	% of Female	% of Total	% of Male	% of Female	% of Total	% of Male	% of Female	% of Total	% of Male	% of Female	% of Total	% of Male	% of Female
Unemployment with primary education	26.2	29.4	22.6	30.4	32.5	27.4	28.5	33.6	19.2	21.6	26	15.7	28.4	30	26.4
Unemployment with secondary education	48	45.2	51.3	44.5	42.3	47.8	46.3	42	54.3	48.9	49	48.5	44.9	46.2	43.3
Unemployment with tertiary education	18	15.6	20.8	18.8	17.4	21	18.2	16.2	21.6	22.2	16.7	29.6	19.6	15.9	23.9
Unemployment (% of labor force, national estimate)	6.7	5.8	8.1	5.6	5.4	6	5.3	5.5	5	6.2	5.7	6.9	..	7.4	8.8
Unemployment, youth (15-24, national estimate)	..	..	..	..	..	..	8.6	8.1	9.7	9.6	8	13.1	11.9	9.8	15.6

World Bank, 2014.

Table 8 shows employment by sector broken down into agriculture, industry, and service employment for the years 2005-2008 and the year 2010, and broken down by gender. The largest employment sector is services in every year given with industry the smallest. The agricultural sector showed the greatest increase between 2008 and 2010.

**Appendix B Table 8: Employment by Sector**

Employment by Sector (% of employment)															
	2005			2006			2007			2008			2010		
	Total	M	F	Total	M	F	Total	M	F	Total	M	F	Total	M	F
Agriculture employment	28.9	41.3	8.3	29.1	41.7	8.4	29.5	41.9	8.4	28.2	41.2	6.2	32.2	44.2	15.2
Industry employment	19.7	20.1	19.1	19.3	20.2	17.8	20.2	20.8	19.3	19.6	20.1	18.8	16.5	17.6	14.8
Services employment	51.4	38.6	72.6	51.6	38.1	73.8	49.8	37	71.7	52.2	38.7	75	51.2	38.1	69.8

World Bank, 2014.

Table 9 shows employment by type of salary for the years 2005-2008 and the year 2010 broken down by gender.

**Appendix B Table 9: Employment by Type of Salary**

Employment by Type (% of employment)															
	2005			2006			2007			2008			2010		
	Total	M	F	Total	M	F	Total	M	F	Total	M	F	Total	M	F
Self-employed	50.2	50.7	49.3	49.5	50.2	48.2	49.2	50.7	46.8	49.4	50.2	48	54	50.8	58.5
Wage and salaried workers	49.8	49.3	50.7	50.5	49.8	51.8	50.7	49.3	53.2	50.6	49.8	52	46	49.2	41.5
Part time employment	13.6	50.7	10.2	11.7	52.7	8.9	12.4	50.5	9.8	12.7	51.4	9.8	30.1	59	21
Vulnerable employment	45.4	44.6	46.8	45.2	44.9	45.7	44.7	44.8	44.6	45.3	44.9	45.8	47	41	55.7

World Bank, 2014.

Table 10 shows employment by age and gender for the years 2005-2008 and the year 2010. Data for child employment (ages 7-14) were only available for the years 2005 and 2010 and shows a significant increase in child employment (includes work only and work and study combined). Employment by age has remained consistent in other age groups and years.

**Appendix B Table 10: Employment by Age**

Labor Force Participation by Age (% of employment)															
	2005			2006			2007			2008			2010		
	Total	M	F	Total	M	F	Total	M	F	Total	M	F	Total	M	F
7-14	10.1	16.2	3.9	..	..	..	..	..	..	..	..	..	31.1	40.5	21.2
15-24*	47.8	64.9	30.8	47.7	64	31.4	47.4	63.5	31.4	47.4	63.5	31.4	47.3	63.2	31.5
15-64*	63.6	82.3	45.6	64	81.9	46.7	64.2	81.9	47.2	64.4	82	47.6	65	82	48.6

\*ILO Estimate – national statistic not available

World Bank, 2014.

Table 11 shows labor force participation and inactivity rate. The inactivity rate is calculated as the difference between participation and non-participation in the labor force. Data were available for the years 2008-2012. In all years the inactivity rate is the highest among youth aged 15-24, and inactivity is greatest among the female population off this same age.

**Appendix B Table 11: Labor Force Participation and Inactivity Rate**

	2008			2009			2010			2011			2012		
	% of Total	% of Male	% of Female	% of Total	% of Male	% of Female	% of Total	% of Male	% of Female	% of Total	% of Male	% of Female	% of Total	% of Male	% of Female
Participation 15-24*	47.4	63.5	31.4	47.3	63.3	31.4	47.3	63.2	31.5	47.5	63.2	31.7	47.7	63.3	32
Inactivity 15-24*	52.6	36.5	68.6	52.7	36.7	68.6	52.7	36.8	68.5	52.5	36.8	68.3	52.3	36.7	68
Participation 15-64*	64.4	82	47.6	64.7	82	48.1	65	82.1	48.6	65.2	82.2	49	65.5	82.3	49.5
Inactivity 15-64*	35.6	18	52.4	35.3	18	51.9	35	17.9	51.4	34.8	17.8	51	34.5	17.7	50.5
Participation 15+*	62.2	79.9	45.4	62.4	79.9	45.8	62.7	80	46.2	62.9	80	46.6	63.1	80.1	47
Inactivity 15+*	37.8	20.1	54.6	37.6	20.1	54.2	37.3	20	53.8	37.1	20	53.4	36.9	19.9	53

*Modeled ILO Estimate, national estimate not available  
World Bank, 2014.*

On the next page, Table 12 shows indicators for the economically active population by urban and rural and by gender for the years with available data. For the years 2007-2008 complete data were available on full time, part time, and under employed workers. For the years 2009-2011 data were only available for gross economic participation.

**Appendix B Table 12: Indicators for the economically active population aged 10 and older, urban and rural**

Economically active population, urban and rural (% of participating population)																														
	2007						2008						2009						2010						2011					
	Urban			Rural			Urban			Rural			Urban			Rural			Urban			Rural			Urban			Rural		
	Total	M	F	Total	M	F	Total	M	F	Total	M	F	Total	M	F	Total	M	F	Total	M	F	Total	M	F	Total	M	F	Total	M	F
Participation* (% of total population)	53.4	63.7	44.4	53.5	75.4	30.2	53.8	64	45	52.6	75.7	28.7	60.9	71.4	51.6	63.3	88.6	36.5	66.5	76	57.6	68.6	89.8	46.4	71.9	81.2	63.8	75.4	92.3	57.4
Full time employment	55.9	62.2	48.3	42.1	46	31.9	59.2	65.8	51.1	53	60.4	32.5																		
Part time employment	9.5	7.5	11.9	17.1	16.2	19.5	8.3	6.3	10.6	17.7	16.2	22.1																		
Under-employment total	34.6	30.3	39.8	40.8	37.8	48.6	32.6	27.9	38.3	29.2	23.4	45.4																		
Under -employment visible	12.6	10.7	14.9	14.5	12.7	19.4	10.3	8.3	12.7	10.0	8.3	15																		
Under -employment invisible	22	19.7	24.9	26.2	24.1	29.2	22.3	19.5	25.6	19.1	15.1	30.4																		

\*Years 2007-2008 given in Net Participation, Years 2009-2011 given in Gross Participation due to variation in data sources from the Nicaragua Department of Statistics  
DES, 2007; 2008; 2009; 2010; 2011

## Appendix C: Nicaraguan Institutions

Nicaragua's telephone country code is **505**.

### Executive Branch

#### **Presidencia de la República**

Presidente

Secretaría del FSLN

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#### **Secretaría de la Presidencia**

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#### **Secretaría de la Juventud (INJUVE)**

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**Secretaría Privada de Políticas Nacionales**

Secretario Privado

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**Government Ministries****Ministerio de Salud (Minsa) – Ministry of Health**

Ministro

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**Ministerio de Educación (Mined) - Ministry of Education**

Ministro

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**Ministerio Agropecuario y Forestal (Magfor) - Ministry of Forestry and Agriculture**

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**Ministerio de Ambiente y de los Recursos Naturales (MARENA)****Ministry of Natural Resources and Environment**

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**Ministerio de Defensa – Ministry of Defense**

Ministro

Casa Ricardo Morales Aviles del Migob 4c. arriba 2do semáforo. Residencial Bolonia. Apartado: 3711

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**Ministerio de la Familia – Ministry of the Family**

Ministro

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**Ministerio de Fomento Industria y Comercio**

Ministro

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**Ministerio de Relaciones Exteriores – Ministry of Foreign Affairs**

Ministro

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**Ministerio del Trabajo (MITRAB) – Ministry of Labour**

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**Ministerio de Transporte e Infraestructura (MTI)**

Ministro

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**Ministerio de Energía y Minas - Ministry of Energy and Mines**

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**Ministerio del Ambiente y los Recursos Naturales (MARENA)**

**Ministry of Environment and Natural Resources**

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## **Legislative Branch**

### **Asamblea Nacional de Nicaragua**

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## **Autonomous Institutions**

### **Administración Nacional de Pesca y Acuicultura (ADPESCA)**

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**Instituto Nicaragüense de Cultura**

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## Financial Institutions

### **Banco Central de Nicaragua (BCN)**

Presidente Ejecutivo

Km. 7 Carretera Sur. Apartado: 2253

Ph: 265-0500, 265-0460 / 1843. Fax: 265-2272

Email: [rmartinez@bcn.gob.ni](mailto:rmartinez@bcn.gob.ni)

### **Superintendencia de Bancos y otras Instituciones Financieras (SIBOIF)**

Vicesuperintendente

Km. 7 Carretera Sur, Managua. Apartado: 788

Ph: 265-1441, 265-1790, 265-1555/57. Direct number: 265-1790. Fax: 265-0965

Email: [vhurtado@soboif.gob.ni](mailto:vhurtado@soboif.gob.ni)

### **Banco Centroamericano de Integración Económica (BCIE)**

Gerente

Edificio Plaza España. Frente a Banco Uno. Apartado: 2099

Ph: 266-4120 / 21 / 22 / 23 ext 3419

Fax: 266-4125 / 266-4243 / 266-4143 ext 3419

Email: [melendeze@bcie.org](mailto:melendeze@bcie.org)

### **Instituto de la Vivienda Urbana Rural (INVUR)**

Presidente Ejecutivo

Embajada Americana contiguo a INISER Gallo y Villa Sur Km. 4 ½ Carretera Sur. Apartado: 553

Ph: 266-3346, 266-6112 / 13 / 14, 266-6351, 266-6510. Fax: 268-1360

Email: [jsilva@invur.gob.ni](mailto:jsilva@invur.gob.ni)

## Decentralized Entities

### **Dirección General de Minas**

Director General

Carretera a Masaya, del antiguo Sandy's 1 ½ Cuadra Arriba, costado Oeste del Hotel Inter.

Metrocentro. Frente al Chamán. Apartado: 8

Ph: 267-1957, 2252-4340, 2260-1957. Fax: 265-1957

Email: [carlos.zarruk@mem.gob.ni](mailto:carlos.zarruk@mem.gob.ni)

### **Corporación de Zonas Francas**

Secretario Ejecutivo

Km. 12 ½ carretera Norte. Apartado: 2437

Ph: 270-2691, 2878-2270. Corporación: 263-4700. Main number: 263-1530. Fax: 263-1700

Email: [ivelasquez@czf.com.ni](mailto:ivelasquez@czf.com.ni)

### **Corporaciones Nacionales del Sector Público (CORNAP)**

Presidenta Junta Directiva

Donde fue ENEL Central 100 vrs al Sur frente a Mi Familia. Apartado: 1909

Ph: 278-4816. Direct: 278-4819. Fax: 267-1181, 278-5010, 270-5002

Main number: 267-2029, 267-5002, 270-9838

Email: [cornap@cornap.gob.ni](mailto:cornap@cornap.gob.ni) , [creyes@cornap.gob.ni](mailto:creyes@cornap.gob.ni)

### **Dirección General de Migración y Extranjería**

Directora General

Semáforos de la Tendería 2c. al Lago

Ph: 249-6670, 244-3989, 249-6672. Fax: 249-2981

Email: [mnovoa@migob.gob.ni](mailto:mnovoa@migob.gob.ni)

### **Dirección General de Aduanas**

Director General

Frente a Coca Cola carretera Norte Km. 4 ½

Ph: 249-5719, 249-3594, 249-3120. Fax: 249-5720, 248-5700

Email: [ems@dga.gob.ni](mailto:ems@dga.gob.ni)

### **Empresa Nicaragüense de Alimentos Básicos (ENABAS)**

Director General

Km. 1 ½ carretera Norte (frente a la antigua Cervecería Victoria). Apartado: 1041

Ph: 248-1640, 248-1641. Direct: 248-1037. Fax: 248-1646

Email: [dirección.ejecutiva@enabas.gob.ni](mailto:dirección.ejecutiva@enabas.gob.ni)

### **Empresa Nicaragüense de Electricidad (ENEL)**

Presidente Ejecutivo

Intersección Pista Juan Pablo II y prolongación Avenida Bolívar. Apartado: 55

Ph: 278-5030, 267-2688, 270-1044. Fax: 267-4377

Email: [enelpres@enel.gob.ni](mailto:enelpres@enel.gob.ni)

**Empresa Nicaragüense de Telecomunicaciones (ENITEL)**

Gerente General

Edificio Villa Fontana 2do Nivel. Apartado: 232

Ph: 270-9683, 278-3131. Fax: 278-1818

Email: [victoria.roma@claro.com.ni](mailto:victoria.roma@claro.com.ni)

**Fondo de Inversión Social de Emergencia (FISE)**

Presidente Ejecutivo

Contiguo a la Clínica Tiscapa. Apartado: 1849

Ph: 277-3340, 278-1664 / 65 / 66 /67 /68 / 69, 270-3940, 252-5919. Fax: 277-4695

Email: [nartola@fise.gob.ni](mailto:nartola@fise.gob.ni)

## Nicaraguan Universities

University	Head	Main Campus	Phone	Fax	Email
Universidad Nacional Autónoma de Nicaragua (UNAN)	Rector	Rotonda Universitaria 1 Km. al Sur. Apartado: 663. Managua	278-6779 267-5071	277-4943	victoria@unan.edu.ni
		Contiguo a la iglesia La Merced. Apartado: 68. León.	311-4014 311-4475-67	311-4970	rectoría@unanleon.edu.ni
Universidad Centroamericana (UCA)	Rectora	Reparto San Juan Frente a Radio Ya. Apartado: 69. Managua	267-0106 2278-8185	270-3627	asrector@ns.uca.edu.ni
Universidad Nacional Agraria (UNA)	Rector	Km. 12 ½ Carretera Norte. Apartado: 453. Managua	233-1619 233-1853 233-1109	233-1619	telemaco@ibw.ni.edu.ni
Universidad Politécnica de Nicaragua (UPOLI)	Rector	Costado Sur de la Colonia Rubén Darío. Apartado: 3595. Managua	289-7740	249-9232	rectoria@upoli.edu.ni
Universidad Nacional de Ingeniería (UNI)	Rector	Avenida Universitaria frente a la Escuela de Danza. Apartado: 5595. Managua	277-1650 270-5611	267-3709	rectoria@uni.edu.ni
Escuela Internacional de Agricultura y Ganadería (EIAG)	Director	De la Policía Nacional 3c. al Oeste, Rivas. Apartado: 5	563-3551 2563-3552	563-3957	eiag@turbonett.com.ni
Universidad Católica Agropecuaria del Trópico Seco de Estelí (UCATSE)	Rector	Km. 166 ½ Carretera Panamericana Norte, Estelí. Apartado: 81	713-6186 713-6181	713-2347	ucatse@ucatse.edu.ni
Universidad de las Regiones Autónomas de la Costa Caribe	Rector	Del puente el Edén, 1 cuadra arriba 2 cuadras al Sur. Apartado: 891	248-4658	248-4685	rectoria@uraccan.edu.ni

Nicaragüense (URACCAN)			248-2118- 19		
Bluefield Indian and Caribbean University (BICU)	Rector	Barrio San Pedro Avenida Universitaria Bluefield. Apartado: 88	572-1277 572-1910	572- 1277 572- 1910	gscastro@msn.com.ni
Universidad Católica Redemptoris Mater (UNICA)	Rector	Km. 9 ½ Carretera a Masaya 500 vrs. al Sureste Managua. Apartado: 6095	276-0004 ext 6000	276- 0590	mmolina@unica.edu.ni
Universidad Americana (UAM)	Rector	Costado Noroeste Camino de Oriente Managua. Apartado: A- 139	278-3800	278- 2974	ernesto.medina@uam.edu.ni eneyda.duarte@uam.edu.ni
Universidad de Ciencias Comerciales (UCC)	Rector	Costado Oeste del Polideportivo España Bosques de Altamira Managua  Apartado: P-84	277-0870 277-1931	277- 3006	gilberto.bergman@ucc.edu.ni
Universidad Iberoamericana de Ciencia y Tecnología (UNICYT)	Rector	Avenida Universitaria, Rotonda Universitaria 100 metros al Sur	278-7231 278-7423	278- 7423	dmejilla@unicyt.edu.ni
Universidad Tecnológica Nicaragüense (UTN)	Rector	Avenida Universitaria. Edificio ATC de la UCA 150 metros arriba en el Ciprés. Apartado: MR- 42	278-1400 278-5480	278- 7366	utn@turbonet.com.ni
Universidad Popular de Nicaragua (UPONIC)	Rectora	Delicias del Volga ½ Cuadra al Este frente a Mántica Repuesto. Apartado: T-31	266 -4044 266-1166	268- 0059	upocyber@cablenet.com.ni
Universidad Centroamericana de Ciencias Empresariales (UCEM)	Rector	Frente donde fue Gallo y Villa Sur. Apartado: 671	266-9875 266-9441	268- 4433	adfucem1@ibw.com.ni

Universidad Hispanoamericana (UHISPAM)	Rector	Reparto Bolonia, del Canal 2 dos Cuadras abajo. Apartado: A-26	268-5669	266-9781	ltc@huispam.edu.ni
Universidad Nicaragüense de Ciencia y Tecnología (UCYT)	Rector	De los semáforos de Rubenia 700 metros al Lago. Pista Iván Montenegro	240-0789	240-0834	rectoria@ucyt.edu.ni rector@ucyt.edu.ni
Universidad Cristiana Autónoma de Nicaragua (UCAN)	Rector	Basílica Catedral 2 ½ cuadras al Norte Avenida Central León	311-0353	311-0360	ucanleon@cablenet.com.ni
Universidad Internacional de la Integración de América Latina (UNIVAL)	Rector	Reparto San Juan No. 529 contiguo a Ópticas Munkel. Apartado: MR-84	278-3203 278-1417	278-3203	unival@unival.edu.ni
Universidad Evangélica Nicaragüense (UENIC)	Rector	Contiguo a Shell, Plaza el Sol. Los Robles. Apartado: R-P082	267-3033 270-1598 278-0945 2270-1601	267-1010 270-1598	bencormar@msn.com.es uenic@cablenet.com.ni
Universidad del Norte de Nicaragua (UNN)	Rector	Antiguas Oficinas de Enabas Estelí	713-6005 713-6998	713-3558	unn@ibw.com.ni
Centro Superior de Estudios Militares (CSEM)	Director	De la Plaza Julio Martínez 300 metros al Sur	277-0475	278-5972	csem@tmx.com.ni
Universidad del Valle (UNIVALLE)	Rector	Rotonda del Periodista 75 metros al Sur (By pass Sur). Apartado: MR-90	278-8626 ext 125 278-8634	278-8729	rectoria@univalle.edu.ni
Instituto Latinoamericano de Computación (ILCOMP)	Director	Semáforos del Colonial 1 ½ cuadras al Lago	249-3716 ext 4	249-5604	direccion@ilcomp.edu.ni