

# Assessment and Analysis of Undergraduate Fall Enrollment Trends of The Selected College of Agriculture at the 1890 Land-Grant Universities: 1996 To 2018

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## ABSTRACT

**Background:** The 1890 land-grant universities consisted of 19 universities, and these networks of schools and colleges were established under the Second Morrill Act of 1890. These universities aim to strengthen research, extension, and teaching in the food and agricultural sciences and work on funding for scholarships and employment, quality advisement, and a network system with mentors for African American students. Besides food and agricultural sciences, 1890 Land-Grant universities create opportunities for African Americans to educate and build careers in agriculture, food, natural resources, and human sciences. **Purpose:** The purpose of this paper is to assess and analyze the college of agriculture's undergraduate fall enrollment trends of all the 1890 land-grant universities from 1996 to 2018. **Methods:** Time series data were collected on undergraduate fall enrollment of the college of agriculture for 18 land-grant universities (one unavailable) and examined the general fall enrollment trend of all universities through the analysis of line chart. **Result:** The most significant output result of the study is that among the 18 universities, eight universities are highly expected to increase the enrollment number of students, two universities are highly potential for losing students in the future, and others have relatively inconsistent growth rate. **Conclusions:** The paper concludes that most of the College of Agriculture at the 1890 Land Grant universities have a high potential for enriching its departments in the future. Colleges of Agriculture at the Land Grant Universities were established to improve higher agricultural education for the minorities, especially African Americans. These universities continuously play a vital role in educating African American students. Furthermore, 1890 universities are extremely important to keep the diversities in the professions in the field of agriculture. It can be concluded that particularly the potential declining colleges (West Virginia State University, Tennessee State University, Kentucky State University, South Carolina State University, and Tuskegee University) should be given special attention.

**Keywords:** enrollment; enrollment trends; trend analysis; 1890 land-grant universities

## INTRODUCTION

The 1890 land-grant universities consisted of 19 universities, and these networks of schools and colleges were established under the Second Morrill Act of 1890. These universities aim to strengthen research, extension, and teaching in the food and agricultural sciences and work on funding for scholarships and employment, quality advisement, and a network system with mentors for African American students. Besides food and agricultural sciences, 1890 Land-Grant universities create opportunities for African Americans to educate and build careers in agriculture, food, natural resources, and human sciences. Over the past centuries, countless press, researchers, authors showed their concerns about the enrollment of minority individuals, particularly blacks or African American students. To be more specific, in the field of agriculture, the participation of African Americans had been declining, or the participation rate is lower during the last centuries. Various steps were taken to increase the participation of African Americans in these related fields. Afterward, for the last around two decades, the participation is way better, and the enrollment

rate in these universities is relatively higher than before. The purpose of this paper is to assess and analyze the college of agriculture's undergraduate fall enrollment trends of all the 1890 land-grant universities from 1996 to 2018.

## AN OVERVIEW OF LITERATURE REVIEW

According to U.S. Census Bureau, the U.S. population will double by 2040 than 1990. Similarly, at the same time, the African American population has a similar growth rate (The Council of 1890 Presidents/Chancellors). Moreover, by the same time, African Americans students will be 15 percent of total U.S. college students compared to 9 percent in 1995. On the other hand, African American college students are supposed to increase 15 percent of the United States college student, whereas white students are expected to increase by 5 percent. The Council of 1890 Presidents mentioned that as African American students & minorities are far behind than others, they should be given special attention.

Furthermore, it was stated that the nineteen 1890 land grant universities could help them fulfil their needs because these universities have diverse faculty. Social support networks positively influence minority undergraduate student's academic success-related outcomes, health, and well-being (Davis,1991). Whereas studying in PWI(predominantly white institutions), African Americans seemed less productive, less social, and stay to themselves, though by attending HBCU, they have greater academic performances, stronger relationships with fellow students, professors, and advisors, more involved with organizations; and have a greater desire to succeed (Wardlow, Graham, & Scott, 1995). Westbrook et al. (2007) commented that recruiters at 1890 land grant universities have to publicize their schools to increase the enrollment of African American students because these universities are smaller than others. All agricultural educational programs aim to appreciate, understand, knowledge, and skills related to the agricultural sciences, agribusiness, and the production and processing of food and fiber, quoted by Newcomb et al. (2010). But due to several reasons, African American students were less interested in taking these extremely important programs. To increase the enrollment of African Americans studying agricultural science, Westbrook (2007) developed recruitment & retention strategies and showed demographic characteristics of 1890 land grant university agricultural science administrators.

Retallick et al. (2008) aimed to examine the enrollment and participation trends of comprehensive agricultural programs. The author collected enrollment data from the year 1991 to 2005. By analyzing The U.S. Department of Education (ED) and the National Student Clearinghouse (NSC) annual reports on higher education fall enrollment, and student outcomes, Juskiewicz (2017) found the decline of community college fall enrollment since 2010 and declination rate of older student's community college fall enrollment is the highest. However, the completion rates almost remain steady during this time. Another similar research, Zweben(2020), showed that total enrollment in U.S. computer science programs increased by 6.2 percent in 2008 over the last year, which is the first increase in total enrollment in computer science programs in six years. Notwithstanding, the undergraduate enrollment increased, degree completion decreased. It should be noted that there was less diversity in computer science undergraduate programs, such as two-thirds of students receiving bachelor's degrees were White, non-Hispanics, but in the case of Ph.D. completion, the total number increased by 5.7%.

Card and Lemieux (2001) showed the trends in school enrollment and completed schooling attainment and tried to figure out the underlying causes of these trends, such as the contribution of trends in the family background & the effect of local variables. Furthermore, card and Lemieux(2001) suggested that college entry rates and college-age enrollment rates were positively correlated with the returns to college for young workers. Volk (1993) examined the enrollment trends in technology teacher preparation programs.

**DATA ANALYSIS AND RESULTS**

**TABLE 1:** Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
YEAR	12	1996.00	2018.00	2007.0000	7.21110
AAMU	11	7.00	775.00	393.9091	240.30500
FLORIDAAM	12	55.00	854.00	552.1667	200.16304
NORTHCATSU	12	195.00	552.00	330.6667	110.89088
TENNESSEESU	12	338.00	449.00	385.4167	32.97784
PR4AIREVAMU	12	281.00	658.00	417.1667	109.78560
Valid N (listwise)	11				

The author found significant changes in the number and type of degrees granted with industrial arts/technology education programs in five-year intervals from 1970 to 1990. Sharik et al. (2015) examined undergraduate enrollment from 1980 to 2012 in Natural Resource Programs in the United States and showed that enrollment trends were highly cyclical as well as varies for the field of study, gender, race, ethnicity, minorities, and other factors.

Davis and Bauman (2011) explained enrollment levels and trends in the population aged 3 and older based on data collected in 2008 by the U.S. Census Bureau in the American Community Survey (ACS) and the Current Population Survey (CPS). The report reveals enrollment declined by 0.7 million in Grades 1 through 12 from 2000 to 2008. On the other hand, college enrollment at its all-time peak, and Hispanic student enrollment increased rapidly by this time. Baum and Payea(2011) discussed and proved the rapid growth of Postsecondary Education by analyzing data from 2009-2011. The authors also discussed other relevant factors tuition and fees, family incomes, and student aid. Schafft (2014) examined and assessed enrollment trends of all Charter Schools in Pennsylvania based on race & socio-economic status and found out the financial impacts of these schools on assigned school districts for academic years 2006-2007 through 2010-2011. Garcia and Alvarez (2019) focused on enrollment inequities between Latinx undergraduate and graduate students for HSIs (Hispanic-serving institution) by analyzing data of 10 years (2005-2015).

**METHODOLOGY**

With this study, the researcher analyzes and assesses 10 years (1996 to 2018) undergraduate fall enrollment data for the College of Agriculture of 1890 Land-Grant universities. By exploring these data, the author examined the following research question:

**Research Question 1:** What were the enrollment trends for the selected College of Agriculture at 1890 Land-Grant universities undergraduate students between 1996 and 2018?

**Data Sources and Measures:** First, the researcher collected data from the Integrated Postsecondary Education Data System (IPEDS) website(<https://nces.ed.gov/>). Then undergraduate fall enrollment data of the College of Agriculture of 1890 Land-Grant universities were extracted at two-year intervals from 1996 to 2018. The researcher extracted 18 university data, but one university data (Southern University) is unavailable at IPEDS but focused on. the following 5 universities are Alabama A&M University, Florida A&M University, North Carolina A&T State University, Prairie View A&M University, and Tennessee State University.

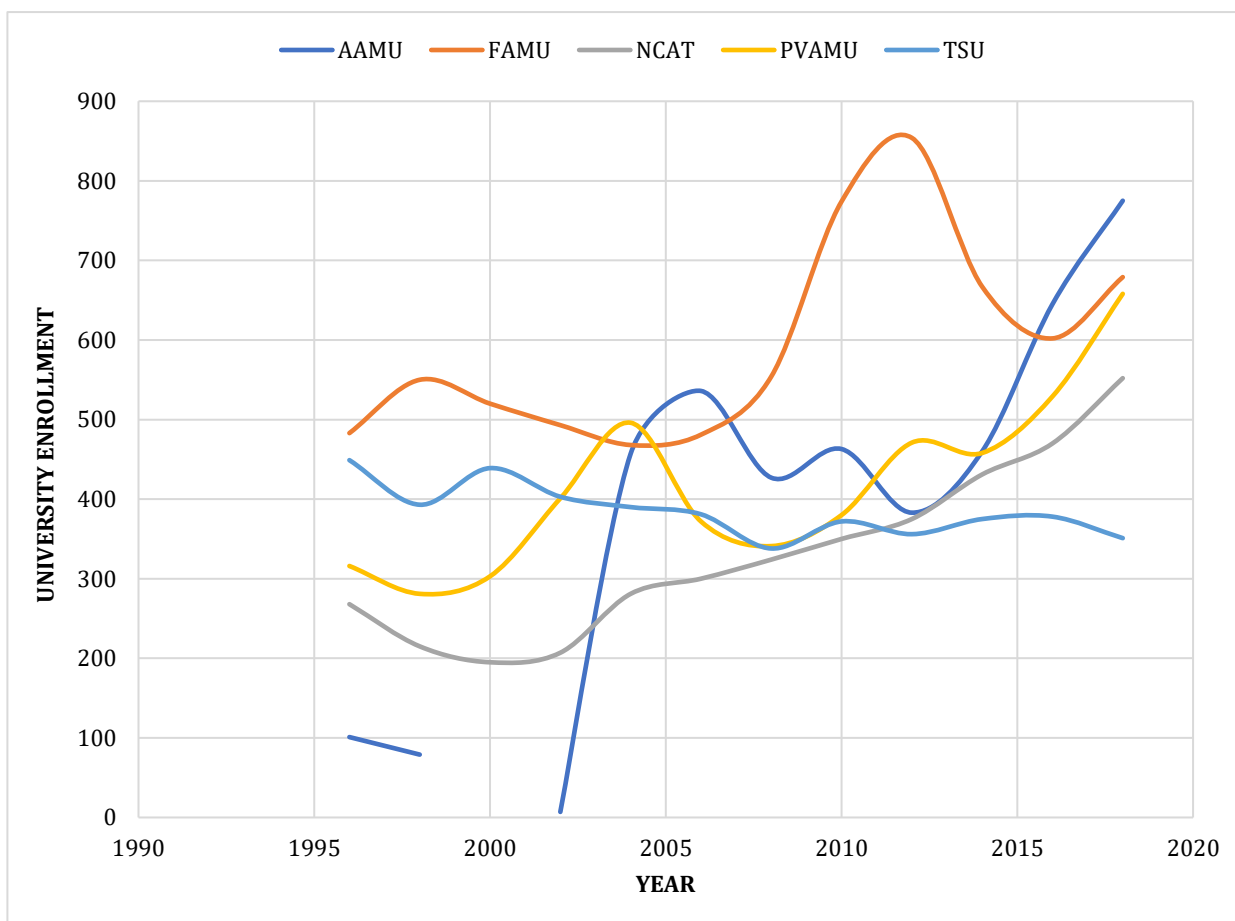
To address the research question, line graphs. The primary outcome was line graph trends which explain the enrollment trends of the undergraduate fall enrollment data of the College of Agriculture of 1890 Land-Grant universities between 1996 to 2018.

Based on Table 1 above, there is 12 valid values of Florida A&M, North Carolina A&T, Tennessee State, and Prairie View A&M of undergraduate enrollment, while Alabama A&M is 11 valid values of undergraduate enrollment. The minimum and maximum of UG enrollment at the 1890 land grant university of the five selected were the Alabama A&M minimum value of 7, the maximum value is 775 and the mean value is 393.909. For Florida A&M, the minimum value is 55 and the maximum value is 854 with mean value of 552.167, while the North Carolina A&T State minimum value is 195, the maximum value is 552 and the mean value is 330.667. The minimum value of Tennessee State is 338 while the maximum value is 449 and the mean value is 385.417. For Prairie View A&M, the minimum value is 281 and the maximum value is 449, and the mean value is 417.167.

Furthermore, the standard deviations for Alabama A&M 7.211, Florida A&M 200.163, North Carolina A&T 110.890, Tennessee State 32.977 and Prairie View A&M 109.785. It means, the data relatively distributed near the value.

**LINE WITH MULTIPLE SERIES**

The multi-series line charts are used to visualize trends and relationships in multiple enrollment datasets. It should be noted that it consists of various data points connected using line segments, where each point represents a single value. The method helps in comparing different 1890 Land –Grant Universities fall enrollment of the college of Agriculture.



**FIGURE 1:** Line Chart with Multiple Series to visualize Trends

*Line graph of the fall enrollment of the College of Agriculture at Alabama A&M University (AAMU) from 1996 to 2018*

In Figure 1 above one can see that fall enrollment from 1996 to 2002 went down from 101 to 7. But then from 2002, it rose to 536 in 2006. Then again, it fell to 427 in 2008 and increased in 2010 to 463. After that, it dropped to 383 in 2012. From 2012 to 2018, the number of students enrolled in the fall rapidly increased from 383 to 775.

*Line graph of the fall enrollment of the College of Agriculture at Florida A&M University (FAMU) from 1996 to 2018*

The above Figure shows that from the year 1996 to 1998, fall enrollment increased from 483 to 550. After that, it gradually decreased to 468 in 2004. Then it soared to 854 in 2012. But then it gradually decreased to 602 in 2016. Though in the year 2018, it increased to 679 in 2018.

*Line graph of the fall enrollment of the College of Agriculture at North Carolina A&T State University (NCAT) from 1996 to 2018*

Figure 1 reveals that from the year 1996 to 2000, fall enrollment decreased from 268 to 195. Then from 2000 to 2018, it gradually increased from 195 to 552.

*Line graph of the fall enrollment of the College of Agriculture at Prairie View A&M University (PVAMU) from 1996 to 2018*

The above Figure 1 shows that fall enrollment decreased from 316 to 281 from the year 1996 to 1998. After that, from 1998 to 2004, it rose to 496. Then the enrollment slowly reduced to 341 in 2008. After the year 2008, the number fluctuated a little bit but climbed to 658 in 2018.

*Line graph of the fall enrollment of the College of Agriculture at Tennessee State University (TSU) from 1996 to 2018*

The TSU line graph reveals that fall enrollment fluctuated a lot from the year 1996 to 2018. First, it decreased from 449 to 393 in the year 1998. Then they rose to 439 in 2000. Similarly, after several increments and decrements from 2000 to 2018, enrollment finally reached 351 in 2018.

In conclusion, North Carolina A&T State University had the most consistent positive growth rate, so from 1996 to 2018, North Carolina A&T State University's college of agriculture improved more than all other 1890 Land-Grant universities. Also, this college is the most potential because it continuously enriches its undergraduate student number by enrolling more students regularly. Alabama A&M University, Prairie View A&M University, Florida A&M University and Tennessee State University have high potentiality for future improvement because these enrollment increments are also consistent.

Most of the College of Agriculture at the 1890 Land-Grant universities have a high potential for enriching its departments in the future. Colleges of Agriculture at the Land Grant Universities were established to improve higher agricultural education for the minorities, especially African Americans. These universities continuously play a vital role in educating African American students. These universities are extremely important to keep the diversities in the professions in the field of agriculture

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