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# AidData GIS International Fellowship: Ghana West-Africa

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**AidData GIS International Fellowship:  
Ghana West-Africa**

**Jason N. Ready**

**December 2016**

**Master's Internship Paper**

**For Masters of Science in  
Geographic Information Science for Development and Environment**

**International Development, Community, and Environment**

**Clark University, Worcester, Massachusetts**

**Submitted to  
Yelena Ogneva-Himmelberger, Chief Instructor**

### Abstract

My internship, or fellowship as it was commonly referred to, was funded by a non-profit organization out of Williamsburg Virginia called AidData. This fellowship took place in in the country of Ghana, West-Africa beginning in May of 2016 and continued for 14 weeks with 40 hours each week. The objective of this internship was to provide in-depth training on the use of geographic Information Systems to Private and Public sectors within the country to allow for increased efficiency, and transparency through data visualization. In accordance with the requirement of Clark Universities GISDE master's program this paper will delve into the aspects, which made up my summer work; including my host organizations, the scope of my work, and the skills used to complete this work.

## Academic History

Name: Jason Neal Ready

Date of Birth: December, 1984

Baccalaureate Degree: B.S. Environmental Studies

Specialization in Geographic Information Systems

Awarded by: University of West Georgia Awarded: May, 2010

### Occupation & continued Academics after acquiring baccalaureate Degree:

GIS Specialist – S Nelson & Associates 2010 – 2011

Natural Resource Manager – United States Peace Corps 2011 – 2013

LiDAR Analyst – Rotorworks llc. 2014 – 2015

### Acknowledgments

I would like to show my appreciation to Pual D. Coverdell fellowship, for providing me with funding which has been vital to allow me to attend Clark University. In addition, I would like to thank Clark University and their passionate professors who go above and beyond to make my experience here challenging and rewarding. Professors such as Yelena Ogneva-Himmelberger, John Rogan, Florencia Sangermano, and Sam Ratick have shown to give all of themselves to insure the success of their students. It is also important for me to thank J.C. Seong of University of West Georgia for pushing me toward this path and helping me in my first exposures into GIS both educationally and professionally.

A special shout-out to United States Peace Corps. I had worked, as a Peace Corps volunteer in Ghana from 2011 to 2013 and this experience had been the best means of preparing me for the hardships of living in a developing country. This experience had allowed me to optimize my efficiency by giving me the foresight to identify and avoid possible pitfalls; along with how to cope with the unavoidable ones.

Finally, I would like to thank all of the amazing Ghanaians I worked with over the summer whose kindness and passion energized me and reassured me that my work was making a difference in their lives and that of their countrymen.

## Dedication

I would like to dedicate this work to Danielle (Dani) Dunlap, a friend of mine who passed away from malaria. She would be doing amazing things right now if she was here still and while I can never live up to everything she would have achieved in her life, she is a reason for trying. She would be 28 and at Emory University in their graduate program.

## Table of Contents

CHAPTER 1: INTRODUCTION.....	7
CHAPTER 2: DESCRIPTION OF ORGANIZATION.....	9
Partnership Structure .....	9
Mission Statement.....	10
Organization Specialization.....	11
Organization Composition.....	12
GIS Use.....	13
Strengths/Efficiencies and Weaknesses.....	14
CHAPTER 3: INTERNSHIP RESPONSIBILITIES.....	17
Position Description.....	17
CHAPTER 4: INTERNSHIP ASSESSMENT .....	21
Acquired Skills.....	24
Reinforced Knowledge.....	27
CHAPTER 5: CONCLUSION .....	28
FIGURES .....	30
REFERENCES.....	35

## Chapter 1: Introduction

First time I took, a geographic information systems (GIS) course I said, “that was horrible, I am never doing that again” the class was dry, time consuming, not engaging with its step-by-step tutorials and dry lecture materials. While the professor was not an engaging lecturer he was a very persuasive advisor and would spend large amounts of time telling the class about its versatility of GIS and its countless application areas this tool could be used in. He had convinced me that it would a valuable skill to obtain for the career path I wanted for myself. His advice has proven invaluable since every professional endeavor I have had since my completion of my undergraduate degree in Environmental Studies has had an element of GIS at its core or as a component. Like my statement at my graduation commencement for my bachelor’s degree of “I am finally done with school, I am never going to school again!” I withhold the right to change my mind and do so at my own discretion.

When I had determined that going back to school for a master’s degree was within my own best interest I began my search looking for schools, which were supported by the Pual D. Coverdell fellowship, which was awarded to individuals who had completed United States Peace Corps Service. Simultaneously I was looking at the top GIS programs in the country. There was only one school, which

fit both of those criteria, a school I had never heard about growing up in Georgia, Clark University. I began to research Clark and was blown away by the program! The school took the 3 areas of my professional interest (GIS, environmental protection, and international development) and arranged them into a single program, the Geographic Information Science for Development and Science (GISDE).

Within the GISDE program, I was required to hold an internship, often focusing on this internship over the summer months between the first and second year of the two-year program. While looking for a summer internship I was hoping to find an internship that allowed me to work on GIS in an environmental context and/or allow me to work internationally. I found a summer fellow program through a non-profit called AidData that would send current graduate and undergraduate students abroad to work on GIS related projects. AidData is located in Williamsburg, Virginia on the William & Mary campus. They had obtained funds to send fellows to 9 countries around the world to provide support in building the capacities of various private and public organizations. The fellowship began with a week-long orientation and training.

## Chapter 2: Description of Organization

### Partnership Structure

To understand the specifics of my summer internship experience it is first necessary to understand the complex relationship between the various partnerships and collaborative efforts between Non-Profit Organizations (NPO), private service providers, development research, and public sector. The internship (or summer fellowship) was initiated through an NPO called AidData, which acquired funds to support fellows with travel, housing, and food. These fellows were partnered with local organizations to support geospatial development. For my fellowship, I was partnered with Ghana's Center for Remote Sensing and Geographic Information Services (CERSGIS). Through their collaborations with a PhD candidate and long working relationship with the Ghanaian government, I was placed with the National Development Planning Commission (NDPC) to provide technical assistance in the form of GIS training and designing the required faculties so that their trained staff could begin implementing these skills into their reporting procedures. Due to a poor choice in the initial interview process, a fellow chosen to work with the Ghana Statistic Service (GSS) was unable to meet the demands of the position. The demands of this position were more closely met by my experience and I stepped in to assist. When this fellow left early due to illness, I took over the project in its entirety.

## Mission Statement

AidData, the organization that arranged for my summer placement and obtained funding is a Non-Profit based out of William and Marry University in Williamsburg Virginia. They are interested in the tracking of aid funding so that “donors and governments can maximize the impact of their investments. Citizens can hold their leaders to account for results.” (AidDATA 2016) Along with this stockpiling of funding information they also create “tools, training and lessons learned to benefit local communities.” (AidDATA 2016)

AidData’s focus on providing training drew the attention of CERSGIS, which has been providing “Remote Sensing and Geographic Information Systems (GIS) services” (CERSGIS 2016). While CERSGIS often “provides support for research and teaching of the application of GIS and Remote Sensing to resources management” (CERSGIS 2016) they have limited staff and cannot provide training without the funding. This is why the partnership with AidDATA was necessary for successful implantation of my summer work.

I was paired with NDPC, which was founded in 1992 by the Ghanaian constitution, which formed this commission to oversee the state of development projects. The NDPC are active throughout the country and most of their staff are permanent. In some situations, however, the Ghanaian President can assign members to the

commission that he views as having a “knowledge and experience of the relevant areas and roles pertaining to development, economic, social, environmental and spatial planning” (GSS 2016). As stated in the Constitution “the core mandate of the Commission is to advise the President on development planning policy and strategy, at the request of the President or Parliament, or on its own initiative” (GSS 2016). These reports that the commission generate for the President and the Parliament are evaluating transactions at a macro-economic level; providing monitoring and evaluation for policies, programs and projects; protective measures of the environment; and evaluating disparities of resources to the ten regions.

### Organization Specialization

Due to the nature of the GSS and the NDPC as national entities of Ghana they are both active throughout all of the country of Ghana. The NDPC works on its reporting, primarily from their office in Accra while their staff travel throughout the country for regional meeting, data collection, onsite investigative. The GSS is similar with all of its data collection being from all of its ten regions; it is all compiled in Accra for analysis. The GSS focuses on statistical data for the country, which is primarily done with this use of the countries’ national census

## Organization Composition

The structure of the NDPC staff were very young; mostly junior staff under the age of 30, well educated in their given specialties ranging from economics, transportation, statistics, and monitoring and evaluation. A large number of the NDPC staff had been educated in Europe and North America (with the help of the Ghanaian government) going to some of the best schools in their given specialties. A benefit of traveling abroad for school or work is gaining an often-underappreciated soft skill of having an international perspective and an appreciation of cultural understanding. This cultural exposure can be an asset in increasing work place efficiency. For the case of NDPC there were less cultural misunderstandings due to the fact that both parties had a more accurate expectation of what is culturally acceptable in a given professional or personal relationship. This western mindset could be seen by looking at the gender diversity of their staff with many of the junior staff being split between male and female. That said, the senior staff was predominantly male.

The opposite could be said for the GSS in almost all aspects of structural makeup. The GSS was predominantly made up of vetted staff, which had all been working with GIS for 10 or more years. The staff had a well-developed protocol that dictated exactly what their process was for each of their given projects, but they had little contact with the larger GIS community with many of them gaining on-the-job experience and not being supported to obtain additional formal education. This long-standing process was

the organization's blessing and its curse since their department was both comfortable with their workflow but stagnant to innovation and was not able to adapt or integrate new technology efficiently. They had a firm grasp on geospatial theory but due to funding limitations were forced to work on antiquated software and with limited access to technology. It was difficult for staff to move up within the bureaucratic structure and it seemed that knowledge sharing from the senior staff was limited to ensure their job security. The staff diversity was almost entirely male with few females only found in their senior staff positions.

### GIS Use

Prior to my trainings, the NDPC had never been exposed to GIS. The largest supporter for the integration of GIS into their reports was the one of their ministers of transportation planning who had been trained as a planner in Canada and the United States. Their reports, which highlight the strengths and weakness of develop in Ghana are text based reports predominantly informed by statistical tables. These reports are often viewed as being long and dry, yet, these reports widely influence the Ghanaian politics and often many pieces of vital information can be overlooked due to the nature of these reports. The use of GIS can give the Ghanaian president and parliament a means to quickly identify geographic areas that are performing well or are in need of additional assistance.

The GSS had been using GIS for many years in a variety of applications. The group of 4 staff I was assigned to work with was primarily tasked to develop cartographic maps of various enumeration zones, which is a division of a geographic area containing around 7000 people. The maps generated by this team were used by census field staff to collect data from citizens living in these specific areas to be applied to the 2020 census. The maps had a traditional cartography style with landmark accuracy being a paramount concern; with up-to-date roads and landmarks to allow the census staff to easily navigate the thousands of enumeration zones throughout the entire country.

#### [Strengths/Efficiencies and Weaknesses](#)

The NDPC seemed to have the benefit of ample funding. This was evident in their new and well-maintained facilities, WiFi access for their entire facility, new work vehicles, modern equipment, and a secure office with a walled/gated compound with several guards at various locations. As stated previously, they had employed young staff, with fresh and informed perspectives; all of the staff had been well educated at schools with esteemed reputations. Their weakness was in their overall inexperience with GIS. Often there seemed to be a lack of dedication to the trainings by most of the staff involved. The poor attendance to the trainings was often blamed on a busy work schedule but I had a suspicion that lack of dedication was linked to their inability to identify current uses of GIS in their reports. The hope is now that they have been

exposed to GIS that they would come up with innovative ways to depict their reports in a spatial context.

For the GSS, the most notable strength with working with them was their dedication and passion for the trainings I was holding. I never had a day without full attendance and the staff were always eager to learn and engaged with the training. They were active learners constantly asking question and informing me when something was unclear. It was obvious how appreciative they were to have access to these training and access to ArcGIS 10.3 software (provided by AidDATA). Since they had an established process of GIS products, trainings I created could easily be tailored to their needs, removing any guesswork to finding relevant topics for tutorial design.

A large hindrance came in the form of their upper management. More than once the training had been hindered by their manager but this was also linked to cultural aspects. In Ghanaian, status is held in very high regard and this culture of chiefs and seniority carries over into the management structure. Showing respect to someone you view as your superior is very important and to circumvent your boss in (even minor) decisions is viewed as being very disrespectful. In attempts to maintain hierarchy, often-basic knowledge is not disseminated to the lower ranking staff, leading to a bottleneck of information and can often slow down progress. In the situation of the GSS, many of

the basic parameters of their work (such as coordinate systems) were never explained to them by the management.

Along with barriers imposed by upper management, the staff was constantly being prevented from working due to infrastructure limitations in the form of regular power outages, unmaintained work vehicles, and no internet access in their office complex. Their facilities were in very poor condition with poorly maintained buildings, no functioning restrooms, rusted out window mesh (compromising their security), and most limiting to their computer based work- no internet connectivity.

None of the shortcomings was more worrisome than the issues of shortages in secure funding. AidDATA had provided the GSS with four license of ArcGIS 10.3, however these licenses are only active for one year and it is unclear if the upper management had truly grasped the excessive cost of ArcGIS licenses. The argument could be made that if funding could not be obtained that they could revert to the old version of ArcView they had been familiar with. The shape files had to be converted from the legacy format to the new shape file format and it is unclear if these files would be backwards compatible with this old version of ArcView. This situation could greatly impact their ability to be productive if they are locked out of their software for a given amount of time.

## Chapter 3: Internship Responsibilities

### Position Description

For the unexperienced, often a posted task description can be lacking and the ability of a new employee to be flexible and adaptable can be important in making yourself a valuable addition to any organization or office place. With the summer position, I encountered just that. I had signed a contract with the understanding that I would be working with the National Development Planning Commission or NDPC performing the specific tasks of...

- Locating & geo-coding development projects from government records
- Researching additional sources of development project data
- Working as a liaison between various Ghanaian Government GIS ventures
- Analyzing of project database for academic and policy-focused research
- Providing trainings, technical assistance, and mapping services for NDPC
- Other Related Activities

Of the tasks listed above, the only tasks that were applicable to my experience were last two listed; providing trainings and technical assistance and 'Other Related Activities'. While some of these goals could become feasible in the future, the staff were not currently capable of achieving these goals with their

limited training and availability of permanent expertise. There were also no developed relationships between government organizations, and access to data and software were severely limited.

I spent much of my time providing trainings, but when I wasn't actively training or providing technical support, I was researching information or creating trainings which were culturally sensitive and relevant to the organizations I was working with.

A more accurate depiction of my responsibilities as a summer fellow consisted of traveling between the three offices of the CERSGIS, NDPC, and GSS.

### **Center for Remote Sensing & Geographic Information Services**

**(CERSGIS)** – There I acted as if it was 'home base'. I used my time at the CERSGIS office to connect with their GIS and remote sensing experts, design training materials and research for upcoming trainings, and report to AidDATA. This time amongst my colleagues was very beneficial for brainstorming, troubleshooting my own problems and making sure to avoid cultural misunderstandings since teaching in another culture is fundamentally different. I found that CERSGIS was not just a resource to the various government agencies they were hired by but also a valuable resource to me. I was actively working as an

extension of their office and helping to form relationships between the agencies' and CERSGIS staff.

**National Development Planning Commission (NDPC)** – I normally visited the NDPC office on Monday and Wednesday each week. As mentioned before, the NDPC had no previous exposure with GIS, so it was determined that QGIS, instead of ArcGIS, was a better software for them to start with due to the large number of licenses they would need and the ease of use for unexperienced trainees. I held training on a variety of topics (Table 1) that were identified to be of particular use to their reports. These trainings focused on the importation and adaptation of data sources from outside sources such as tabular data, digitized features, geo-referenced raster data, and created vector data. These skills, along with basic cartographic concepts equipped them to begin the creation of new GIS data from information they would obtain through their reports. The NDPC commonly uses tables and charts to convey information in their reports. With increased GIS skills, they now have a powerful new way to convey complex and abstract information to their audience.

**Ghana Statistic Service (GSS)** – It is of note that the GSS was unable to mobilize their staff for trainings for the first half of the internship and because of this, the fellow assigned to work with them came to assist me with the NDPC staff trainings.

While I was not assigned to work with GSS, I ended up taking a lead role in providing training for this organization as well. I initially became involved by assisting in trainings on Tuesdays and Thursdays. The GSS staff were proficient in ArcInfo but required our assistance to learn the newest version of ArcGIS 10.3. The advanced skill-set of the GSS was problematic for my co-intern however. While she was well suited in assisting me in the training to the NDPC in introductory principles of GIS and the use of QGIS, she was 'unable' to run Arc on her Mac computer and had little previous experience in GIS. Because of this she didn't feel comfortable training them and had me take over before leaving early due to illness.

Due to the GSS's advanced experience with GIS it made the selection of topics for training very easy because they knew exactly what they needed to know and our trainings consisted of systematic analysis of their procedure in the old version of ArcInfo 3 and finding an equivalent process in ArcGIS 10.3. These trainings consisted of vector editing, cartography, template creation, coordinate systems, file conversion, and map packaging. Unfortunately, unlike my assigned project, I was not able to train them as well as I would have liked. Although they were able to continue their work with a modern version of Arc, I did not have enough time to help them improve their efficiency. Another disappointment was not being able to help them develop a network geodatabase so that they could work

on their projects in one environment. To offset this, I have continued communications with them and have been working with them to find a solution for increased productivity with the use of coding.

#### Chapter 4: Internship Assessment

The focus of any internship is to develop your abilities, skills, and have a general experience of growth. As a reflection of the experience for the summer of 2016 with the AidDATA fellowship, I can say that I had developed many skills, not just hard or technical skills but many soft skills related to development, international work, and travel/cultural knowledge.

The skill of researching was one, which I developed the most throughout my time in Ghana. Due to their many years of experience, the GSS staff had very advanced workflows and had specific tools needed for the progression of their work. Due to the specialized nature of their work, I was often tasked to find solutions that would create accurate results but could also be effectively trained since I only have a short time to work with them. With the NDPC, many of the tools I trained them in I had previous experience working with in the past but even then, I would often research to make sure that the training materials I was generating were accurate and streamlined as the most efficient way of performing the specific task.

I had also worked with the formation of geodatabase design and had explored many aspects of database creation and management in preparation for the summer work since I had initially believed that the bulk of my time was going to be focused on the creation of this database. This was an area I had done some previous work in but never to the magnitude that would have been necessary with the census. Unfortunately, due to time limitations and staff availability I was not able to create a database with the GSS.

Often many people write off these shortcomings of a given situation as a loss or negative experience; however, it is important to note that even though my GIS abilities were not vastly expanded, they were expanded upon and confidence in the use of some of the software's functionality was greatly increased.

It is also vital to stress that what my internship lacked in hard skills it made up for two-fold with soft skills. I learned about international development, seeing how non-profits function and many of the problems they are faced with such as funding, and creation of sustainable impacts. I experienced how government agencies in a developing country function (or fails to). Having this kind of knowledge can be useful later to avoid or plan for these possible issues working in international development in the future.

All my work with both the GSS and NDCCP was focused on capacity building through GIS training and I became very familiar with the development of effective training materials and presentation. It was also important that I took my audience into account and the educational system from which the staff had been accustomed to. The Ghanaian way of teaching and learning is very different and can create miscommunications and greatly reduce or halt learning if not accounted for. For instance, teachers are viewed with unfaultable respect and to show any questioning of a teacher or their lecture materials is viewed as being very disrespectful, thus, if you were to ask if everyone understood everyone would say “Yes” regardless of comprehension. Due to cultural differences like this, I amended my lessons to better suit them and with this example, I would not state yes or no questions and would request examples from them instead.

Due to the complex nature of the partnerships and the high amount of travel to various offices, I did not have a defined supervisor managing my time. This made it important that I be self-motivated and responsible for my own time. This forced me to place deadlines on myself and force myself to keep to them. This was additionally important because in my position, I was viewed as an “expert” and to keep a professional appearance of a teacher and leader I had to keep the respect of the trainees. In Ghanaian culture, respect is very important, if you

lose face it is often very hard to regain it and can often greatly effect cooperation between the parties.

Even with the respect from the trainees, I often found my patience being my most tested attribute. In countries, such as Ghana, things move very slowly and to fight against the current will not just wear you down it will also stress the relationships of the people you work with. I had to anticipate when the power would cut off and be prepared to work offline due to it being off for hours at a time. I had to accept that the internet would probably not be working and kick myself for not bring it on a flash drive. I often was frustrated with trainings that would be canceled due to poor attendance, to find out that there was a meeting in the other part of country, which no one informed me they had to attend.

### Acquired Skills

There was a host of skills, which I had to develop on the fly while in my internship. Many of these skills I had some previous experience with but it was important that I strengthen these skill sets within the time I had in country. I would work on these skills alongside the staff, quickly 'Googling' solutions, other issues would require me to travel to internet cafes to download data, and more often, my evenings were spent researching from my room late into the night.

The fact that the NDPC was learning GIS exclusively in QGIS forced me to research functionality that I had previously only undertaken in ArcGIS. This would normally be performed a day or two prior to the training and I would create a PowerPoint describing the objectives of the given subject and a create a tutorial in a word document. These tutorials were often researched online and would be adapted to the data. This led me to become much more proficient in the use of QGIS for rudimentary functionality of the software, along with increasing my ability to research for assistance.

Working with the GSS was a slightly different situation. Initially I had assumed it would be a very similar training situation as it was with the NDPC. In reality, the limited time and more advanced nature of the GSS made this type of formal lecturing very inefficient and often lead to things progressing too slow for them and me preparing detailed lectures that did not touch on exactly what they needed. As a solution to this, I spent time job shadowing them, learning what tools they relied on in the old ArcInfo software and finding solutions in the modern software. Some of the tools that were most vital to their production were tools that are rarely focused on in our GIS classes- things as if conversion of text labels into movable objects was very important to their cartographic final products but was something that I never had to worry about prior. These tasks were either researched there or taken home and researched in my free time.

Another skill that I had to work on with the GSS was the formation of Geodatabase. As a part of the government census, it was vital that their information was up to date and accurate. I had felt the most efficient way to achieve this was with a geodatabase. I had very little experience on the formation of geodatabases and had to research this before traveling to Ghana and while there. In addition, I had hoped that they would be able to have an enterprise geodatabase but unfortunately, they did not have the expertise nor the funding to support this type of database.

One of the initial hurdles I had to overcome with the GSS work was that they would often speak in terminology that was foreign to me as someone who had no experience in working with the collection and compiling of census data. This made the previously mentioned job shadowing, even more valuable. In the process of working with them, I learned about the complex nature of data collection for a national census.

At the completion of the summer, I had experienced working with government organizations in two very different work atmospheres. At its completion, I felt adept at the creation and execution of a training curriculum. I had experienced two very different training situations where I was training new users with QGIS in a

formal lecture style with the NDPC and the polar opposite with the GSS where I supported them with informal troubleshooting with experienced GIS technicians in ArcGIS.

### Reinforced Knowledge

I had acknowledged almost immediately that the skills I had obtained at Clark University had placed me into another level of competitiveness early on. In the initial week of training with AidDATA it was apparent that the skills we had been given were by far from those of other Universities. Aerial (another Clark student) and I were the most advanced fellows in the training group. It was so apparent that we were prepared for this summer's fellowship that the staff charged with training us asked us for opinions and to help other fellows with the training sessions and troubleshoot problems with the ArcGIS training lecture.

The experience I had obtained at my previous job and supported with my schoolwork at Clark also allowed me to work with some LiDAR point clouds that CERSGIS staff had collected but no trained staff to process. The hope was that this data could at some point be used in a REDD+ project later on.

This summer work in Ghana was incredibly fluid and because I did not have a dedicated management structure that I fit within I had an incredible amount of

freedom and my productivity and drive for having a successful internship was completely internally motivated. I could practically attribute some of this internal drive and motivation to move the trainings forward by the strong work ethic and time management that the classes and labs at Clark University forced me to adapt to. I had to be incredibly self-disciplined or no forward momentum could have been achieved and I owe that in part to Clark.

## Chapter 5: Conclusion

Before accepting the summer fellowship with AidData I had performed a thorough and thoughtful mental exercise weighing the pros and cons of taking this opportunity. I looked at various scenarios and tried to identify problems I could expect to encounter throughout my time in Ghana. This included everything from the severe such as theft and serious illness to the trivial like missing American comforts and hardware failures. Even though I did have a host of the trivial setbacks (and none of the major ones) I can happily report that I had identified all of these pitfalls prior to ever stepping foot in Ghana.

While I had my reservations at the completion of my summer work, I can now say that this summer was a positive experience. I was not learning new software or developing a new skill, but I was taking my existing skills and strengthening them to the point of feeling comfortable with teaching nearly anyone

on these skills. It would often test my motivation, restraint, patience, and adaptability but the enthusiasm and gratitude from the people involved in the trainings made the experience a positive one. At the completion, I felt I had truly made a difference in the lives and careers of the people I was training. I hope that they have a positive impact on their country by utilizing the most modern geospatial technologies to better inform the Ghanaian people.

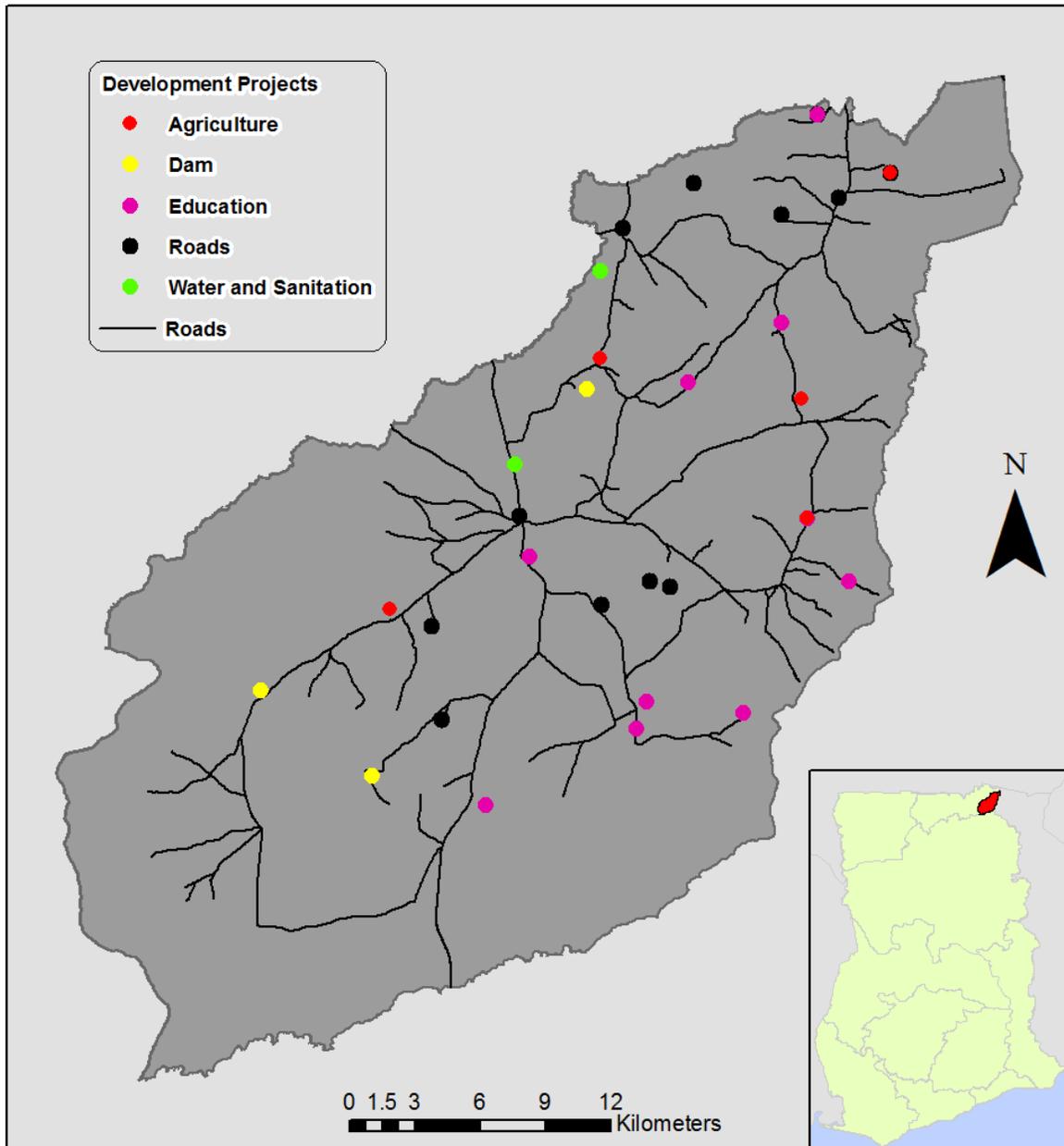
## Figures

Table 1

<b>NDPC Training Syllabus*</b>	
<b>Dates</b>	<b>Topic</b>
<b>Week 1</b>	
Monday 6/27	Introduction
Wednesday 6/29	Intro and Geocoding
<b>Week 2</b>	
Monday 7/4	Data Import
Wednesday 7/6	Attribute Tables
<b>Week 3</b>	
Monday 7/11	Cartography
<b>Week 4</b>	
Monday 7/18	Queries
<b>Week 5</b>	
Monday 7/25	Geoprocessing
Wednesday 7/27	Plugins & Georeferencing
<b>Week 6</b>	
Monday 8/1	Digitization
Wednesday 8/3	Choropleth Maps
<b>Week 7</b>	
Monday 8/8	Google Earth for Geocoding
Wednesday 8/10	TBD

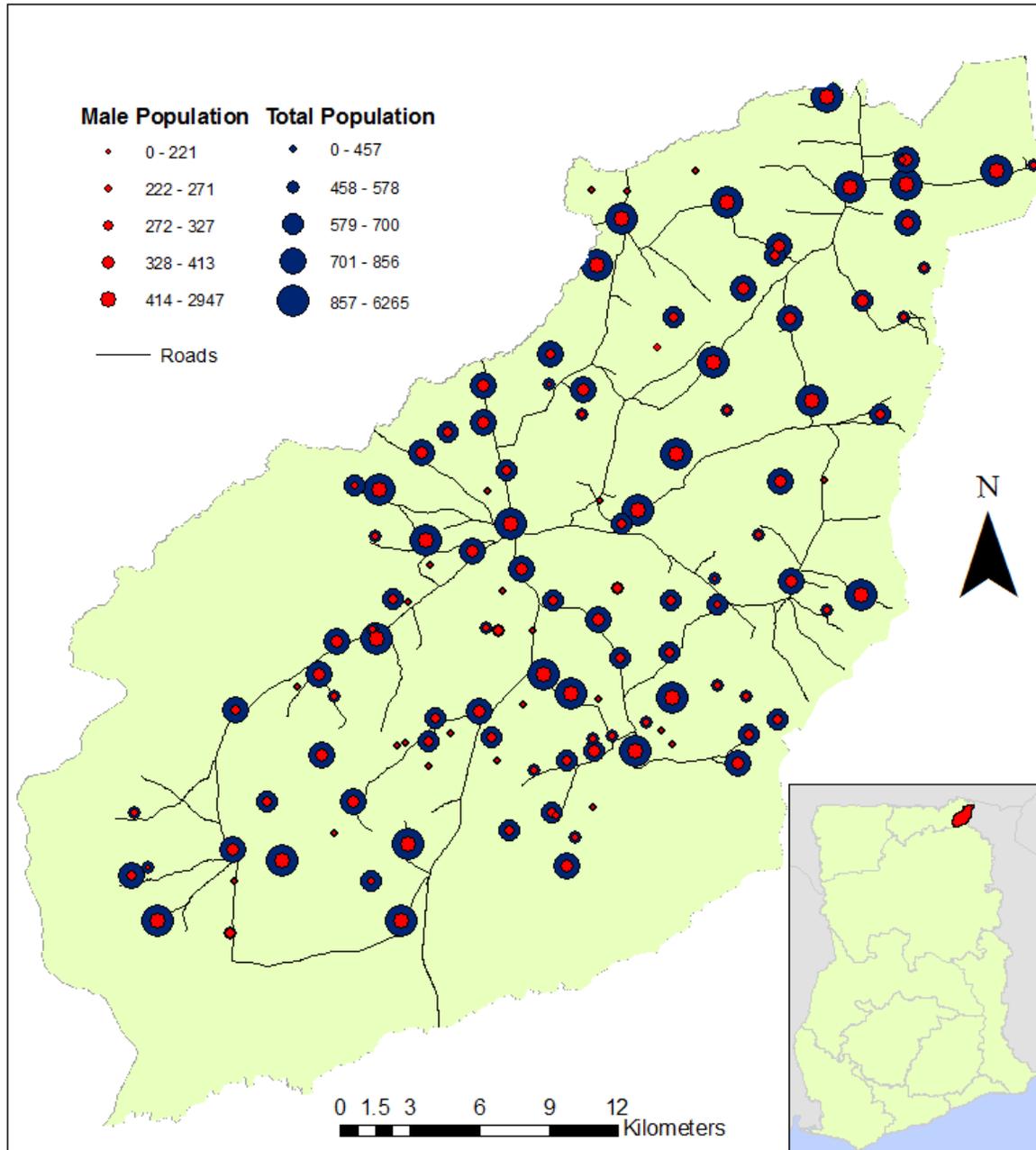
# Development Projects in Garu District in Ghana's Upper East Region 2014

Contribution of CERSGIS & AidDATA  
Map Created by Jason Ready  
June 15th 2016



# Population Composition of Garu District in Ghana's Upper East Region

Contribution of CERSGIS & AidDATA  
Map Created by Jason Ready  
June 15th 2016

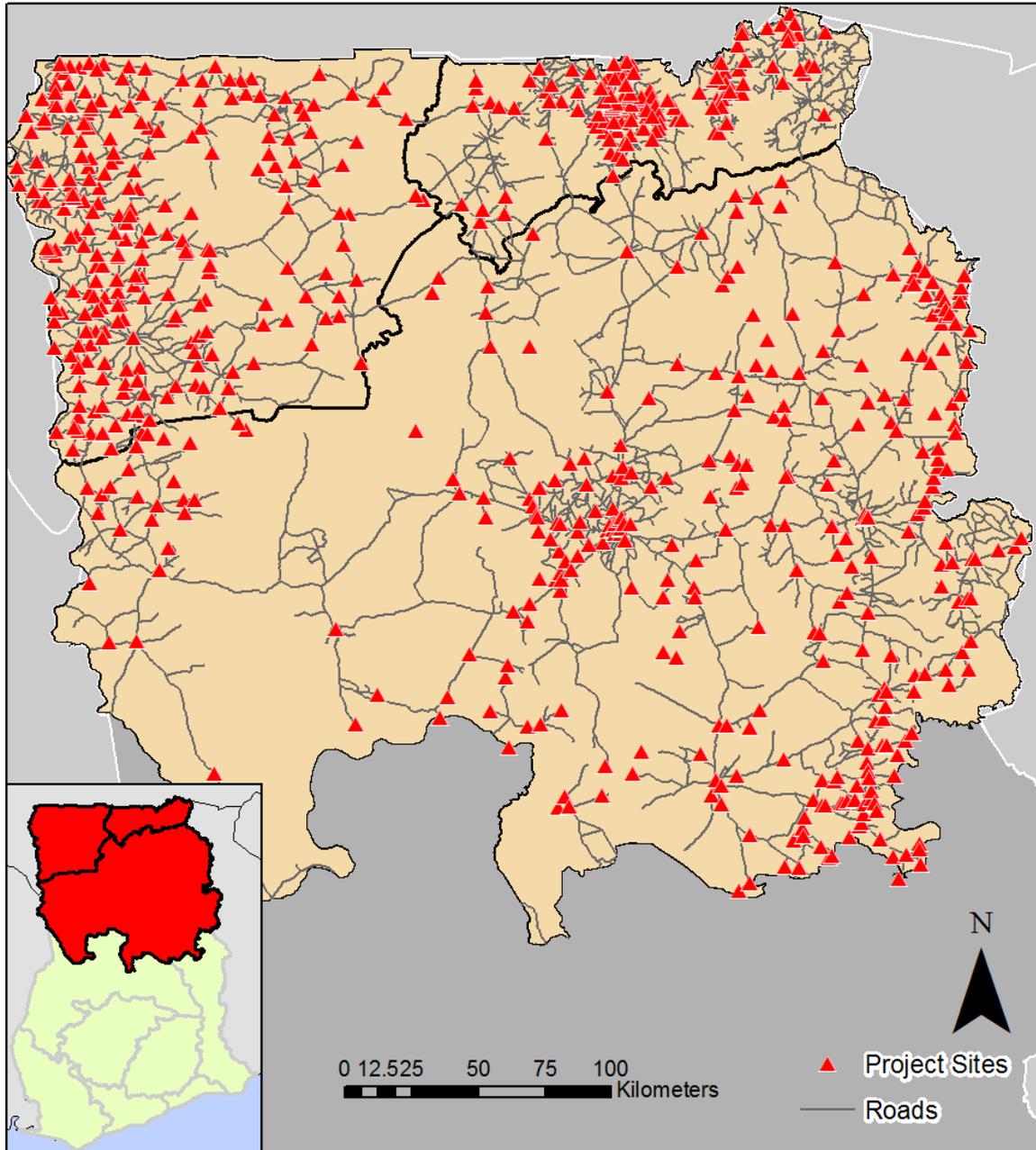


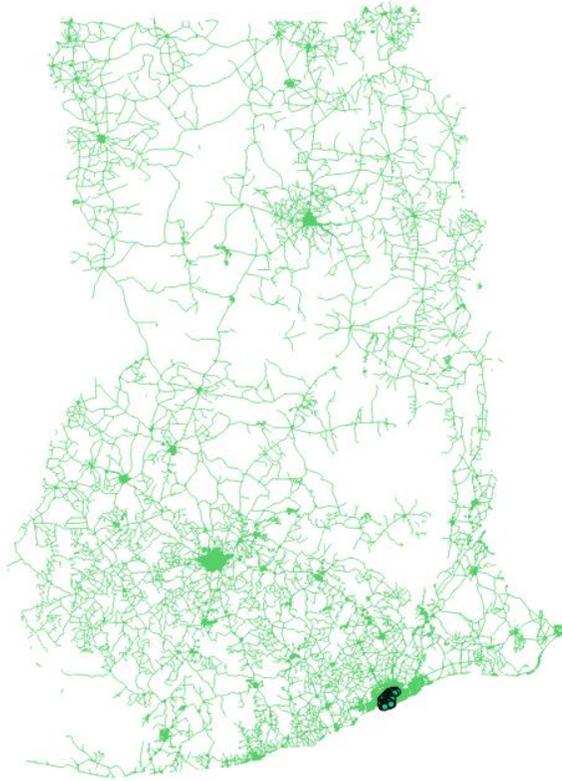
# Aid Project in Ghana's Upper East, Upper West, and Northern Region between 2011 to 2013

Contribution of CERSGIS & AidDATA

Map Created by Jason Ready

June 15th 2016





This Is a map of Accra including roads, water bodies, and aid projects created in the symbology lesson



Example of tutorial image I created for the lecture on geo referencing

## References

AidDATA (2016). Retrieved 2016, 2016, from <http://aiddata.org/>.

[OBJ]

CERSGIS (2016). "Center for Remote Sensing and Geographic Information Services- Home." 2016, from <http://cersgis.org/>.

[OBJ]

GSS (2016). "Ghana Statistical Service ". 2016, from <http://www.statsghana.gov.gh/>.