

**EDUCATION, RESEARCH, AND EXTENSION: AN EVALUATION OF  
AGRICULTURAL INSTITUTIONS IN TUNISIA**

A Thesis

by

SHANNON HAJDIK BEDO

Submitted to the Office of Graduate Studies of  
Texas A&M University  
in partial fulfillment of the requirements for the degree of

MASTER OF SCIENCE

May 2004

Major Subject: Agricultural Education

**EDUCATION, RESEARCH, AND EXTENSION: AN EVALUATION OF  
AGRICULTURAL INSTITUTIONS IN TUNISIA**

A Thesis

by

SHANNON HAJDIK BEDO

Submitted to Texas A&M University  
in partial fulfillment of the requirements  
for the degree of

MASTER OF SCIENCE

Approved as to style and content by:

---

Kim E. Dooley  
(Chair of Committee)

---

Scott Cummings  
(Member)

---

Edwin Price  
(Member)

---

Glen Shinn  
(Head of Department)

May 2004

Major Subject: Agricultural Education

## ABSTRACT

Education, Research, and Extension: An Evaluation of Agricultural Institutions in  
Tunisia. (May 2004)

Shannon Hajdik Bedo, B.S., Texas A&M University

Chair of Advisory Committee: Dr. Kim E. Dooley

Texas A&M University of the United States and the *Institute National Agronomique de Tunisie* (INAT) of Tunisia established a collaborative relationship of mutual exchange of information and ideas for the further advancement of both universities. The researcher worked closely with these universities to conduct a qualitative study in Tunisia to determine the effectiveness of agricultural institutions working to further development in that country. The emphasis of the study was on the transference of knowledge and innovations from the research level through extension to the farmers and other end users. The triangle of teaching, research, and extension provided a base perspective.

The researcher interviewed 37 respondents, including researchers, extension personnel, administration, professors, and farmers. From data that respondents provided, the researcher used a constant comparative method to organize results into the strengths, weaknesses, opportunities, and threats of the agricultural institutions as a system. Overarching themes included a pointed focus on meeting farmer needs, but this desire was hindered from being carried out fully due to complex communication systems and

an organizational structure that did not facilitate change. Hope did abound for Tunisian agriculturalists because the opportunities available through globalization and international collaboration far outweighed any possible threats to development, such as fierce competition in trade and lack of quality water.

The researcher also made specific recommendations based on the information gathered in the study. These recommendations were based on the findings of the study, and they were directed to leaders within the Tunisian agriculture system and other agriculturalists wishing to further development in countries facing similar situations as Tunisia.

## ACKNOWLEDGEMENTS

The first acknowledgement I would like to give is to my wonderful husband and best friend, Andrew Bedo. He has shown great patience throughout this process. He always believes in me and tells me that I can do anything I put my mind to. He did not let me give up, even when finishing a master's degree seemed absolutely impossible. He is the biggest blessing in my life, and I do not know what I would do without him.

I also want to thank the best committee any graduate student has ever experienced. Dr. Kim Dooley is my inspiration, and I can always catch excitement from her and her passion for agricultural education. She has spent countless hours working with me on this thesis. Dr. Scott Cummings has been an excellent supervisor and mentor, and he has been instrumental in my development as a person and as a professional over the past six years. Dr. Edwin Price has my deepest gratitude for trusting me to represent Texas A&M University as the first Aggie student to study in Tunisia. His confidence gave me the courage to travel across the world alone and live in a country I knew very little about. Dr. Price and others in the International Agriculture office (specifically Cathryn Clement) have given me much needed support, answers to countless questions, and encouragement.

When I first arrived wide-eyed in Tunisia and knowing absolutely no Arabic or what I was really doing, my Tunisian partners were the most excellent of hosts. I cannot thank my Tunisian "father," Dr. Moncef Harrabi, enough. He took me into his home and into his family, quite literally. He provided everything I needed to ensure that I

experienced a pleasant stay and successful research in Tunisia. I owe thanks to Dr. M'Naouer Djamelli, who was always on hand to fix my many problems and give advice on the direction of my research. Finally, my adventures in Tunisia would not have been as enjoyable without the friendship of so many of the INAT students. Among many others, Aziza, Maher, and Nadia translated for me, took care of me, befriended me, and let me study in their air-conditioned laboratory. Thank you for your kindness to *L'Américain*.

## TABLE OF CONTENTS

	Page
ABSTRACT .....	iii
ACKNOWLEDGEMENTS .....	v
TABLE OF CONTENTS .....	vii
LIST OF TABLES .....	ix
 CHAPTER	
I INTRODUCTION .....	1
Theoretical Base for the Study .....	2
Statement of the Problem .....	7
Purpose of the Study .....	7
Research Questions .....	8
Context for the Study .....	8
Importance of the Study .....	9
Delimitations .....	9
Limitations .....	10
Basic Assumptions .....	10
Definition of Terms and Acronyms .....	10
II REVIEW OF LITERATURE .....	12
Extension .....	14
Development in Tunisia .....	16
Tunisian Government .....	18
Education .....	19
Tunisian Culture .....	20
International Trade .....	22
Globalization .....	23
Communication .....	24
Summary of Literature .....	25

CHAPTER	Page
III	METHODS..... 27
	Trustworthiness..... 31
	Data Collection and Analysis..... 33
IV	RESULTS..... 35
	Overview of the System..... 37
	Research Question 1..... 44
	Research Question 2..... 54
	Research Question 3..... 62
V	SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS 64
	Summary of Methodology ..... 65
	Summary of Findings..... 66
	Conclusions..... 70
	Recommendations for Tunisian Agriculture Institutions.. 72
	Recommendations for Further Study ..... 73
	REFERENCES..... 75
APPENDIX A	INTERVIEW QUESTIONS DIRECTED TO EMPLOYEES OF AGRICULTURAL INSTITUTIONS..... 78
APPENDIX B	INTERVIEW QUESTIONS DIRECTED TO CLIENTELE OF AGRICULTURAL INSTITUTIONS..... 80
APPENDIX C	INFORMATION SHEET GIVEN TO RESPONDENTS ENGLISH AND FRENCH ..... 82
APPENDIX D	PEER DEBRIEFING ..... 85
APPENDIX E	AUDIT TRAIL..... 89
VITA .	..... 93



**LIST OF TABLES**

	<b>Page</b>
Table 1	Interview Code Identification..... 33
Table 2	Summary of Strengths of the Tunisian Agriculture System..... 51
Table 3	Summary of Opportunities for the Tunisian Agriculture System 54
Table 4	Summary of Weaknesses of the Tunisian Agriculture System .... 60
Table 5	Summary of Threats to the Tunisian Agriculture System..... 61

## CHAPTER I

### INTRODUCTION

In the contemporary global market, it is imperative that nations work together to share information and technology so that they can benefit from each other. Thus, the *Institute National Agronomique de Tunisie* (INAT) and Texas A&M University have formed a cooperative relationship in order to explore opportunities for agricultural development. This relationship involves the exchange of ideas through interaction of faculty and students at both universities. Through this project and a memorandum of agreement between the two universities, faculty members have discussed agricultural issues that both Tunisian and Texan agriculturalists face. They have also exchanged graduate and undergraduate students so that future leaders in agriculture can gain a broader understanding of how agricultural issues are dealt with in a culture other than their own.

These two institutions can collaborate to help solve shared, contemporary agriculture issues; however, it is imperative to remember the variant backgrounds from which they have come. Because Tunisia has been able to use agricultural development as a ladder to climb out of the poverty it once faced, Texas A&M could greatly benefit from studying the agricultural system that supported this development. The principles and practices used in Tunisia will be helpful in planning agriculture projects in other

---

This thesis follows the style and format of the *Journal of Agricultural Education*.

developing nations. Tunisian agriculturalists can use this study to assist planning for their own programs.

### **Theoretical Base for the Study**

Although much of Tunisian agriculture struggled with adequate irrigation (among other problems), this North African nation produced an abundance of such crops as wheat, citrus, olives, and dates. Livestock producers raised sheep, goats, cattle, poultry and camels. Farms blanketing the countryside, even in desert regions, gave a positive look into the agriculture sector of the Tunisian economy. Although many farmers struggled to make ends meet, quality of life was slowly improving for the Tunisian population. The agriculture sector as a whole sought to take advantage of export opportunities, and trade was increasing with Europe and the rest of the world (World Link, 2000).

At one time, Tunisia did not experience as much economic success. After being torn by war for centuries, Tunisia finally gained independence from France in 1957. The new nation struggled with poverty. However, Lupien explained that Tunisia was able to break free from the chains of poverty through “a focus on improving agricultural production, processing, food preservation, and marketing as a basic and effective way to improve food supplies and generate more employment and income for low-socioeconomic and undernourished rural populations” (2002, p. 2). Thus, Tunisia discovered first-hand the value of agricultural investments. Van den Ban and Hawkins commented that an economy could experience up to a 40% rate of return on agricultural

investments (1996). However, the one stipulation these authors added to their conclusions was that farmers must be competent, and that competence developed mainly through the work of extension (van den Ban & Hawkins, 1996).

Therefore, Rogers' theory of the Innovation-Development Process was exemplified through Tunisia's agricultural development. Rogers claimed six steps to innovation development and diffusion (2003). The process began with a need – in this case, it was a need for increased profits and productivity for agricultural commodities. The second step was research, when someone discovered how to meet that need, whether through adopting an innovation from others or by creating a new technology. The next stage was development, or putting the innovation into a usable form. After development was commercialization, which was actually placing the innovation on the market to be used by the general population. Step five concerned diffusion and adoption, which was critical to the entire process. If the population did not accept the innovation, it would never be diffused into the society. The researcher focused the study mainly on this stage of the process. Finally, the process reached the consequences stage where the effects of the innovation developed within the society (Rogers, 2003). The Innovation-Development process was used to analyze Tunisia's continuous journey from poverty to economic stability.

Essential to the Innovation-Development process were the organizations that facilitated movement of innovations through the various stages. Tunisia had a system of teaching, research, and extension institutions that aided agricultural education and the development and diffusion of agricultural innovations into society. Mwangi claimed, "to

alleviate rural poverty by ensuring food security and sustainable improvement in people's well-being, research-based technologies must reach and be widely adopted by farmers" (1998, p. 63). Tunisian research institutions such as INRAT focused on long-term, basic research (need and research stages). In addition, the *Agence de Vulgarisation et Formacion Agricultura* (AVFA) functioned as Tunisia's extension organization to apply that research at the practical, producer level (diffusion stage). INAT acted as both a short-term project research facility and an education institution to prepare its students for a career in agriculture (Clement, 2001). As in any agricultural education system, these institutions needed to work together to accomplish their shared goal of increased agricultural production and profitability for Tunisian farmers.

One critical characteristic shared between teaching, research, and extension institutions was a communication network to exchange information and ideas. Valente emphasized the importance of communication networks to diffusion of innovations: "social structure – who communicates with whom – determines the spread of influence, ideas and products" (1999, p. 1). Several concepts influenced communication networks between groups, and one especially important aspect was that of the weak tie (Valente, 1999). Individuals could use these weak ties to gain information from outside their usual sphere of communication. Rogers concurred, "These heterophilous interpersonal links in a system, called 'bridges,' are especially important in conveying information about innovations" (2003, p. 306). Valente agreed that these weak ties helped an organization keep from falling into mediocrity and ruts and were the secret to allowing new information to flow through the organization (1999).

In addition, communication networks included certain opinion leaders who possessed influence within the social system. Rogers defined opinion leaders as those individuals who influenced the attitudes of others within the social system and affected the rate of adoption for an innovation. These opinion leaders acted as advocates for (or against) an innovation, and allowed the information to spread to other individuals in the community (Rogers, 2003). Valente explained that an effective flow of information moved from the original source to opinion leaders and then to various individuals (1999). Opinion leaders also had greater exposure to outside influences and were the ones who communicated outside their tight inner circles (Rogers, 2003). In other words, opinion leaders among Tunisian farmers were the ones who communicated the message from agricultural institutions to the general population.

Power structure also played a role in how communication networks functioned within and between organizations. Power structure determined *who* made decisions and *how* those decisions were made (Rogers, 2003). Change agents needed to maintain effective communication relationships with decisions makers as part of their job responsibilities (Beltran, 1974). Rogers defined a change agent as someone who attempted to influence the decisions of a specified clientele toward certain innovations (2003). For example, an extension educator (change agent) would try to influence farmers (clientele) to adopt no-till practices (innovation). Agricultural education institutions faced issues with the power of the national government agenda sometimes conflicting with what they knew the farmers need from them (van den Ban & Hawkins, 1996).

Not only did communication networks need to function effectively within and between the agricultural education institutions, but these networks also needed to extend to their clientele. Change agents needed knowledge of innovations as well as the communication skills to share that knowledge with their clientele (Mwangi, 1998). Zinnah suggested that researchers should have some kind of involvement in extension so that they could aid in the transfer of technology (1994). Borlaug echoed this advice through his recollection of wheat research in Mexico. Extension was not necessarily his job, but he could not let their progress go to waste by refusing to fill the extension role as well (1995).

Tunisia's culture was unique, considering its rich Carthaginian history, the influence of the French for seventy-five years, and its more relaxed religious rules, compared to its Arab neighbors. The reaches of a society's culture extended into every aspect of the way of life, and Tunisia's agricultural education system was no exception. Cultural values affected the rate of adoption and how the change agent sought to encourage change (Rogers, 2003). Bairstow, Berry and Driscoll showed that because families are the center around which many cultures were focused, the change agent's consideration of the family could determine whether or not clientele would participate in the program (2002). Cultural considerations played an integral role not only in the methods used by agricultural agencies, but also in the culture of the organization itself.

### **Statement of the Problem**

Although research indicated the importance of communication networks in the diffusion of innovations, no research had been conducted in Tunisia to study the effectiveness of agricultural education institutions in encouraging development. It was not understood how these institutions worked together in order to encourage the diffusion of agricultural technology. A study determining the strengths, weaknesses, opportunities, and threats facing these institutions could help Tunisian agriculture continue its journey toward prosperity. Leaders in Tunisian agricultural institutions did not have adequate information in order to effectively plan future programs and guide the future of agriculture in Tunisia.

### **Purpose of the Study**

The researcher sought to evaluate the agricultural teaching, research, and extension institutions in Tunisia in order to determine the effectiveness of the diffusion of innovations from these institutions and how this leads to agricultural and economic development within the country.

### ***Specific Objectives***

1. Examine the linkages in communication between Tunisia's agricultural institutions.
2. Determine how agricultural technology was transferred to the general public.
3. Identify the structure within and between teaching, research, and extension institutions.



4. Examine effects of culture on organizational structure and function of the institutions.

### **Research Questions**

1. What are the strengths (positive internal influences) and opportunities (positive external influences) that encourage development in Tunisia within the context of agricultural institutions?
2. What are the weaknesses (negative internal influences) and threats (negative external influences) that inhibit development in Tunisia within the context of agricultural institutions?
3. How do communication networks function to promote the flow of knowledge from research and teaching, through extension, to the farmers and then from farmers to these institutions?

### **Context for the Study**

The researcher lived in the capital city of Tunis for six weeks during the study. She worked directly with the faculty of INAT, and through them, she also worked with faculty of various other agricultural institutions. Most Tunisian agricultural institutions were based in Tunis, so this location allowed for easy access to many respondents. Some interviews were conducted outside of Tunis, from centers in the north to research stations in the south.

### **Importance of the Study**

This study is beneficial to Tunisian agriculture because an outside observer was able to understand the agricultural system as a whole in terms of diffusion of innovation and agricultural development. This study will help leaders in agriculture make informed changes in the system in order to continue improving the services they can provide to farmers and other agriculturalists.

The exchange of ideas between INAT and Texas A&M focused on shared interest areas such as marketing, irrigation, animal science, and crop production. One of the major areas of study upon which all these areas depended was agricultural education. Tunisia used the aspects of teaching, research, and extension to aid the transfer of agricultural technology and knowledge, and this system aided Tunisia's overall economic development. Understanding this system will aid current developing countries in planning their own agriculture education systems. Texas A&M can use this information to plan international agricultural development projects as well.

### **Delimitations**

The researcher conducted this study within the city of Tunis, Tunisia with a few interviews taking place in the rural areas outside the city. Data collection was delimited to 37 adults, including INAT faculty, extension faculty and clientele, and research faculty and recipients. Data was collected over a six week time period in May and June, 2003.

### **Limitations**

This study was limited to those individuals with whom the researcher could verbally communicate, either in English or through a translator. Limitations also included collection of data from only those agriculturists who were benefiting from services provided by the teaching, research, and extension system within Tunisia, either as paid staff or as clientele.

### **Basic Assumptions**

It is assumed that the information provided by the respondents is representative of the viewpoints of agriculturalists in Tunisia.

### **Definition of Terms and Acronyms**

The terms and acronyms lists below are used throughout this document.

*APIA – Agence de Promotion des Investissements Agricoles*, agency for promoting investments in agriculture

*AVFA – Agence de la Vulgarisation et de la Formation Agricoles*, The Agency of Extension and Training in Agriculture

*CRDA – Commissariat Regional Development Agricole*, government office for each *gouvernement*

*Gouvernement* – political division of land, similar to a state, but it is not self-governing

*Groupement* – a unit within the Ministry of Agriculture with the purpose of promoting a specific agricultural commodity

INAT – *Institute National Agronomique de Tunisie*, National Agronomy University of Tunisia, based in Tunis, Tunisia

INRAT – *Institut National de la Recherche Agricole de Tunisie*, National Agricultural Research Institute of Tunisia

IRESA – *Institution de la Recherche et de l'Enseignement Supérieur Agricoles*, Umbrella organization within the Ministry of Agriculture that manages all research institutions in addition to the agricultural universities

Texas A&M – Texas A&M University based in College Station, Texas

UTAP – *Union Tunisienne de l'Agriculture et de la Pêche*, “professional” Tunisian Union of Agriculture and Fishing

## **CHAPTER II**

### **REVIEW OF LITERATURE**

Development has evolved through various trends as history has progressed. The current dominant trend in development and aid has been the phenomenon of globalization (Browne, 1999). This trend cannot be clearly defined or entirely understood because it represents such complex interrelationships, although these relationships link people, institutions, and cultures much closer to each other than one might first believe. Many researchers, sociologists, and authors have attempted to narrow globalization to a certain definition, but no single viewpoint seemed to cover the vastness of this new era, if it can even be restricted to an era.

However, several attempts at explaining globalization are worthy of consideration. Wolf defined globalization as, “the increased speed, frequency, and magnitude of access to national markets by non-national competitors” (2002, p. 5). The author included ALL markets in his definition, including cultural, social, as well as economic markets. Friedman emphasized that globalization is the international system of integration and webs that replaced the Cold War system of division and separation. Globalization gave people, business, and nations that ability to “reach around the world farther, faster, deeper, and cheaper than ever before” (2000, p. 9). Friedman even spoke of how Tunisia’s choice to sign a free-trade agreement with Europe signaled its ability to pull ahead, while other Arabic countries who refused collaboration have stagnated. This

economic gap was induced by Tunisian leadership's realization that international and free trade are the key to economic success (Friedman, 2000).

One piece of the enthralling globalization puzzle is agricultural development. As are all parts of this puzzle, agricultural development is intimately and irreversibly locked into affecting and being affected by every other element of globalization. Agriculture affects the culture, language, economics, attitudes, politics, and technology of a country both directly and indirectly. Borlaug asserted that "agriculture is one of the pillars on which all civilization rests today" (1995, p. 89). The evolution of agriculture is also determined by these other factors. Friedman gives the example of a precision farmer using Global Positioning System (technology) to increase profits per acre (economics) and who chats online with other precision farmers (language) (2000).

Development itself can be characterized as "the process of transference of decision-making and power so that the people themselves can ascertain their own future. It is a process of stepping from one evolutionary moment to the next; from relief to self-help to development outreach to self-hood, determination, and decision" (MacCracken, 1977, p. 18). Development has many working parts and factors that determine the ability of a country to move toward an increased quality of life. Specifically, aspects of agricultural development to consider include program planning and evaluation, resource allocation, culture, politics, and education.

The basic tools to accomplish agricultural development include teaching, research, and extension. In some form, these three make up the triad of integral ingredients for development. If one of these three is missing, the other two cannot be

effective. The land grant system in the United States is an excellent example of designing collaboration between all three entities by housing them all within universities (Herren & Edwards, 2002). Other models for agricultural development also place these three aspects in close juxtaposition. Mwangi emphasized that research and extension efforts are crucial for development, and these change agents must be properly trained (1998). The researcher emphasized the role of extension in her evaluation of the Tunisian agricultural system.

### **Extension**

Although no agriculture system can grow without the influence of research or the aid of formal teaching, the extension aspect of agriculture is the link between research, teaching, technology, and the people themselves. Ntifo-Siaw and Agunga asserted that an effective extension system has the power to create sustainable agricultural development in Africa (1994). Research will not just find its way to the people on its own (Borlaug, 1995). Mwangi emphasized that in order “to alleviate rural poverty by ensuring food security and sustainable improvement in people’s well-being, research-based technologies must reach and be widely adopted by farmers” (1998, p. 63).

The key to a successful extension program is a grassroots approach where change agents work to discover the true needs of the local people. Educational programs are planned around these needs. For example, extension agents can use a participatory demonstration where a local farmer will be the example of how a new innovation works and can benefit the other farmers (Capacity Building, 2000). Women extension workers

can also be hired to meet the specific needs of women in agriculture (Capacity Building, 2000). An effective approach to local extension is to use the farmers themselves to spread the word (Borlaug, 1995). This grass-roots approach is also effective because local farmers can identify with local educators and advisors. If extension educators are instead unfamiliar and associated with government administration, they will not be as trusted, and their efforts may be ineffective (Foster & McBeth, 1996).

One theory suggested to aid this grassroots approach is decentralized extension. Rondinelli defined decentralization as the transference of authority and decision-making power to smaller units or local governments (1977). Van Crowder acknowledged that a renewed general focus on meeting farmers' needs has led to decentralization so that extension is able to address specific, local needs. Local control would also increase effectiveness of fiscal resources and encourage farmer participation, especially if they knew their input would actually make a difference (1996).

Whatever agricultural programs are begun in an area, a vital part of development is continuous evaluation. Smith concurred that "in the process [of agricultural development], systems design and methods for monitoring and evaluation are critical to help guide the process to a successful conclusion" (2000, p. 2).

Extension systems do not encourage development without any setbacks or challenges. Traditional extension approaches suffer from a lack of training for agents, especially as they are expected to know everything about everything (Ntifo-Siaw & Agunga, 1994). Rivera explicated that extension must continuously change to keep up with rapidly changing information (2000).



An excellent example of how the various aspects of agricultural development affect the growth and success of a nation can be found in the case of Tunisia. The following sections will explicate how this small, North African country has been affected by efforts toward (and some unintentional negative effects on) agricultural development. Tunisia has also made strategic efforts in development, as the following paragraphs will show.

### **Development in Tunisia**

In 2003, Tunisia boasted a population of about 11 million people. The state-endorsed religion is Islam, and although religious tradition is not as strictly enforced as in other regions, certain aspects of Islam are still revered through the majority of the population (Tunisia, 2003).

Although much of Tunisian agriculture struggles with adequate irrigation and low prices for produce (among other problems), this nation produces an abundance of such crops as wheat, citrus, olives, and dates (Tunisia, 2003). It is a leading supplier of olive oil, with a total of 55 million olive trees growing in every available patch of soil (Cook, 2000; Tunisia, 2003). Livestock producers raise sheep, goats, cattle, and camels. The fishing sector is more traditional, but 20% of the national catch is exported (Tunisia, 2003). The agriculture sector seeks to take advantage of export opportunities, and trade is increasing with Europe and the rest of the world (World Link, 2000). Agriculture contributes 14% to the national GDP, but 30% of the population are employed in the sector (Tunisia, 2003).

At one time, Tunisia did not experience as much economic success. After being shuffled from the power of one dominate ownership to the next and being torn by war for centuries, Tunisia finally gained independence from its last colonizing power, France, in 1957. The new nation was not quite prepared to be left alone after such a long reliance on its ruling nations, and the people struggled with poverty. However, Lupien explains that Tunisia was able to break free from the chains of poverty through “a focus on improving agricultural production, processing, food preservation, and marketing as a basic and effective way to improve food supplies and generate more employment and income for low-socioeconomic and undernourished rural populations” (2002, p. 2).

The success of the agriculture sector is a reflection of the accomplishments Tunisia has experienced in many areas of growth. Tunisia’s current per capita income averages \$6,090 per year, and the middle class consists of over half the population (Zakaria, 2003), which places the country above the arbitrary line that defines a developing country. Tunisia’s lack of natural resources is partly to ‘blame’ for its economic success. While those Arabic nations who have abundant natural resources have relied on this wealth to bail them out of bad economic policies, Tunisia was forced to develop human resources and a truly functioning economy, including development of international trade relationships (Friedman, 2000; Zakaria, 2003). Through growth in human resources, such as checking population growth, decreasing poverty tremendously, the evolution of a significant middle class, and raising the quality of life of women, Tunisia has experienced great success and growth in the last thirty years (Morrison & Talbi, 1996). Major achievements include decreased disparity between income levels

and a population that collectively looks to the future (Morrison & Talbi, 1996). This focus on human resources is greatly attributed to Tunisia's first president, Habib Bourguiba. Bourguiba emphasized modernization and education, increased status for women, and emphasized secularization of society and education (Morrison & Talbi, 1996).

### **Tunisian Government**

The Tunisian government deserves much credit for its support of development, specifically in agriculture. Its leaders defied traditional Arabic practices in order to evoke societal equality for women. The government wisely invested in infrastructure that has supported private industry (example: tourism) (Morrison & Talbi, 1996). Incentives for farmers were offered through tax breaks and government loans through the *Banque Nationale Agricole* (BNA) (Tunisia, 2003). The government sought to assist farmers in developing new farming practices and alleviating water issues (Tunisia, 2003).

The political arena is relatively stable and democratic as a multi-party presidential republic (Cook, 2000; Tunisia, 2003). The president holds the power to appoint the prime minister and Council of Ministers, and the term limits were recently increased to five terms of five years each (Tunisia, 2003). The current president, Zine al Abidine Ben Ali, is currently serving his third term in office after Bourguiba was declared medically unable to perform his duties in 1987 (Tunisia, 2003).

However, the government has also been a crutch for private enterprise that has actually harmed industry growth. It has protected its domestic suppliers so that they have

not been able to develop and become strong on their own (Cook, 2000). Over-involvement of the government has even led to a couple of economic crises (Morrison & Talbi, 1996). Wasteful public enterprises owned by the government have also been a setback, although the government has been encouraging the development of small private businesses (Morrison & Talbi, 1996; Tunisia, 2003).

The increasing economic growth was not augmented by political reform; however, economic changes led to slow political reform (Zakaria, 2003). Therefore, the government slowly began to change in order to meet the needs of the economy and private enterprise. Tunisia had emphasized human resources; the current challenge was to wean the baby private enterprises off government milk and allow them to mature (Wolf, 2002).

Another control measure taken by the government was restrictions placed on freedom of speech. The constitution granted the freedom of expression, but all media and publications were subject to scrutiny and review by the government (Tunisia, 2003).

### **Education**

Contributing to the achievements of Tunisia was “an exceptional emphasis on education,” which contributed to increased quality in labor and incomes (Morrison & Talbi, 1996 p. ). Education was one of the main efforts Bourguiba emphasized at independence in order to help the country rise out of poverty. To Tunisia’s credit, the country was able to maintain the quality of education while increasing the number of students 14 times over (Morrison & Talbi, 1996). Evidence of the government’s

commitment to high quality education for its people was the amount of money that was spent; up to 20% of the total state revenues are spent on education (Tunisia, 2003). At least 9 years of primary and secondary school was required for every child, but this goal was not fully met in some rural areas and for 11% of Tunisian girls who did not attend school (Tunisia, 2003).

One of the most beneficial effects of the increased level of education in the Tunisian population was that it changed both men and women's attitudes about "modernization and opening to the outside world" (Morrison & Talbi, 1996, p. 29). This openness helps with technology transfer and changing traditions (Morrison & Talbi, 1996). Thus, Tunisia as a whole is more open to new ideas and development opportunities.

However, this country could not simply rely on past accomplishment; it needed a focus on the future. Cook suggested, "further development of educational, and more specifically vocational, opportunities, as well as further liberalization of the domestic economy will likely mitigate the problems facing internationally competitive firms" (2000, p. 20). Vocational opportunities certainly included agriculture skills and knowledge.

### **Tunisian Culture**

In order to understand development in Tunisia and where its future leads, one must first understand the unique culture of this country. After being ruled by France for 73 years, this country developed a mix of French and Arabic culture. The mix of Arabic

and French language was the most obvious characteristic. French was the business language, but Arabic was spoken in homes (Tunisia, 2003). Islam was a pillar of society, but some rules were lax, such as alcohol being forbidden in Muslim belief but being readily available, especially for men (Tunisia, 2003). The personal aspect of business interactions was emphasized, so small talk was common (Tunisia, 2003).

Culture also affected the way the people interact and communicate. Tunisians did not use delegation, and many senior level managers could be found doing mid-level jobs (Cook, 2000). Several specific aspects of Tunisian culture directly affected its development in agriculture and in general. A discussion of those characteristics follows.

### ***Self-sufficiency***

Many nations have the goal of becoming self-sufficient, especially if they are on the latter half of the development continuum. Tunisians also had this desire to be self-sufficient. The government supported efforts toward this goal, and the people themselves were proud of their ability to attain self-sufficiency. For example, the government worked to make Tunisia self-sufficient in gas, even if that meant dipping into reserves (Tunisia, 2003). This theme returned again and again as the researcher studied the evolution of Tunisian agriculture.

### ***Women***

At independence, almost no women had an education; however, in modern times, the vast majority of women were educated, and they had an education and lifestyle comparable to European women (Morrison & Talbi, 1996).

However, most women still have not attained absolute equality with men. Most unskilled workers are women (Cook, 2000). Also, females are separated from men in social settings and other events, such as in mosques or at funerals (Tunisia, 2003). Percy suggested that women have access to agriculture information and support in order to increase productivity (2000).

### **International Trade**

Tunisia is a leading African exporter, ahead of most other countries on the continent and even ahead of its Arab neighbors (Cook, 2000; Friedman, 2000). The value of exports has grown faster than the overall economy, but this growth has only kept pace with the increase in world trade (Cook, 2000). International trade's share of the GDP has continually increased, from 54% in 1987 to 71% in 1997 (Cook, 2000). This percentage reflects Tunisia's efforts to keep up with globalization trends and increasing trade relationships with other countries. Its chief competitors are Morocco and Turkey (Cook, 2000). Tunisia has accomplished much growth in international trade, but as with other areas of development, every country, no matter how developed, must continue to keep pace with global growth (Friedman, 2000).

Several competitive advantages offer Tunisia a head start in the global market, if exporters are able to make use of these circumstances. For example, Tunisia has a competitive advantage in its proximity to Europe, so Tunisian exporters can offer fast delivery of goods (Cook, 2000). Tunisia is an associate member of the European Union, but the preferential access does not include most agricultural products (Cook, 2000).

However, they do have their foot in the door. Beginning in 1996, the European Union and Tunisia began efforts toward developing a free trade relationship; the agreement will slowly expand until 2010 (Tunisia, 2003). Although this agreement does not involve agriculture, the relationship will help Tunisia work toward trade in agriculture. Another advantage is that Tunisia's climate allows it to grow winter crops in close proximity to Europe, and they can manipulate harvest times to coincide with periods of higher market prices (World Link, 2000).

Only 10% of Tunisian agricultural companies have foreign ties, so these relationships need to be expanded (World Link, 2000). Suggestions for expansion include focusing private investment on using the highly skilled labor force, collaborating in research and development projects with Europe, and diversifying tourism (Morrison & Talbi, 1996). As far as specifically agricultural markets, Tunisia is the number one date producer in the world, but only 30% of these dates are exported (World Link, 2000). This market could definitely be expanded, as well as the olive industry, in which Tunisia is the number four olive oil producing country in the world (World Link, 2000).

### **Globalization**

Tunisia's experience with globalization began over 2500 years ago with the invasion of the Romans in 146 BC. Because the nation has been affected by various cultures that have ruled over it, outside influences can easily play a prominent role in every aspect of Tunisian life, from politics to food products, especially when increased communication across the globe makes this transfer ever easier and faster.



Globalization may seem like the perfect opportunity for this country, but there are also some challenges. When countries all dip into the same international markets, over-supply occurs, which causes problems such as falling prices (Wolf, 2002). Tunisia needs foreign investment and increased transfer of technology for investment needs (Morrison & Talbi, 1996). Browne agrees that as countries wish to expand their global opportunities, the information revolution will aid the development of partnerships through better communication (1999).

### **Communication**

Communication is essential if Tunisia wishes to continue developing all areas of the economy and society. Efficient communication techniques are necessary on international, national, organizational, and personal levels.

Some progress has been made to improve means of communication on an international level, such as telephones and the Internet (Cook, 2000). Sometimes, it still takes many weeks for a phone line to be connected (Cook, 2000). Telecommunications prices are high (Cook, 2000).

Rogers asserted that communication of innovations included homophilous and heterophilous relationships. Homophily is the state in which people in like situations and from similar circumstances communicate with each other. This type of communication is very effective because the people understand each other, but information sources are not broad. Heterophily allows more sources of information because it is communication between people from different backgrounds and circumstances (Rogers, 2003).

Homophily uses a system of weak ties to diffuse information and innovations through a population. Zinnah commented that weak links are common between teaching and research institutions, extension, and the farmers themselves (1994). Zinnah also suggested that researchers become involved in extension at least minimally in order to understand the real needs of their constituents (1994). Thus, heterophilous relationships (with different people and organizations), in addition to weak ties, aid the diffusion of innovations and agricultural development.

On a personal level, Mwangi argued, “change agents may know the solution to problems confronting farmers, yet be unable to communicate these solutions if they lack effective communication skills, and do not apply sound extension education principles” (1998, p. 63). This level of communication links extension and agricultural education issues. A university may graduate hundreds of students proficient in technical fields like plant breeding or agricultural engineering; however, if none of these new professionals know how to impart their knowledge to other people, their degrees are practically useless. In the same way, even if extension agents have the most up-to-date information about new technology, the information will be useless if the agents do not know how to encourage diffusion and adoption.

### **Summary of Literature**

The literature focused on the importance of teaching, research, and extension aspects of development. Tunisia steadily progressed over the past half-century, but more could still be accomplished. At the heart of this development was the effect the Tunisian

government, education system, and culture had on the direction agriculture had taken. Globalization and international trade, as well as an emphasis on communication, are factors that will determine the future success of Tunisian agriculture. Chapter III cites the methodology the researcher used to find her own conclusions.

### **CHAPTER III**

#### **METHODS**

This study was qualitative in nature due to the detailed information sought by the researcher. The researcher used naturalistic inquiry in order to let the study develop as it progressed and to obtain a greater understanding of the human intricacies of the system that would be lost if traditional quantitative methods were used.

Naturalistic inquiry, as characterized by Erlandson, Harris, Skipper, and Allen, emphasized the importance of context to the study by considering interrelationships and not separating information from the situation that surrounds it (1993). Thus, this study included detailed descriptions of data within its context. For example, Tunisian farmers could not be described separately from their struggle to find better prices for their products.

The researcher did not claim generalizations to be applied to any country “similar” to Tunisia because no country is just like Tunisia. However, through thick description applied to the data within its context, readers can understand the agricultural system in Tunisia as well as use those ideas they deem applicable and transferable to their own situation.

Naturalistic inquiry also focused on grounded theory – ideas and recommendations rising directly from the collected information (Erlandson, et al., 1993). This research method allowed room for more than stated facts; less concrete information such as observations and feelings were used as data. The researcher herself was the main

research tool, so all of her experiences were included for consideration in the study. Thus, some of the findings are cited as an observation. Because biases can never be fully contained in any scientific study, the researcher used naturalistic inquiry not to contain them, but to control for them (Erlandson, et al. 1993). The researcher also followed the principle of emergent design – the direction of the study developed as the study progressed (Lincoln & Guba, 1985). Due to these characteristics, the researcher felt that naturalistic inquiry would be the most beneficial model to follow in order to collect the desired data and present the information in the most effective manner possible.

The basis for the study was a grant through the USDA to encourage collaboration between Texas A&M and the *Institut National Agronomique de Tunisie* (INAT). Background information was collected on the history of agriculture in Tunisia, as well as the current situation and issues the country faces. Based on this previous research, the researcher was able to develop research questions and preliminary interview protocols (Appendices A and B). Separate protocols were developed for respondents from the government employee and clientele points of view. These protocols were designed to be flexible in order to change as the research changed, in accordance with characteristic natural inquiry and the emergent design of the study.

The researcher followed the guidelines of the Institutional Review Board (IRB) of Texas A&M. Guidelines included obtaining verbal consent from participants before interviews. The researcher also provided an explanation of the study to each respondent (Appendix C).

The researcher worked in cooperation with and as a guest of INAT, so the president of the university acted as a gatekeeper for the study. Erlandson, et al. defined a gatekeeper as someone with the power to allow access to respondents or to keep the researcher from gaining access to certain respondents (1993). The gatekeeper played an important role in this study because the researcher had to rely on him to not only decide who *could* be interviewed, but also decide who *would* be interviewed and to make the appointments for the researcher. The gatekeeper also provided students from the university to go with the researcher and help translate. The study also had other gatekeepers who assisted in identifying potential respondents, such as a professor from INAT as well as the Ministry of Agriculture itself. The initial “program” of interviews was scheduled for the researcher to gain access to agricultural institutions, as a result of the researcher’s expression of interest in extension and understanding the agriculture system as a whole. The official program was approved by the Minister of Agriculture as a good representation of the agriculture system.

The original intent was purposive sampling, and the researcher attempted to obtain as many divergent viewpoints as possible. She was limited, however, by access to people, knowledge of who actually had divergent viewpoints, and the language barrier. Gatekeepers helped in obtaining access to needed respondents, but unavoidable limitations did affect collected data. The initial assignment of interviews for the researcher was a possible limitation, but the researcher did have the freedom to initiate interviews on her own, as she did. Another limitation was that the researcher assumed that translations were accurate. Translations were supplemented with observations and

the researcher being able to communicate with those who could speak English or the use of her limited French and Arabic. About half of the respondents could speak at least some English, which really aided communication efforts. The researcher made great consideration of these limitations in reporting findings, and she worked to obtain reliable data by seeking the same data from various sources, which aided in triangulation of the data. More interviews than originally expected were conducted in an effort to maintain reliable data. Erlandson, et al. concurred with the importance of trustworthiness in establishing credibility of the findings (1993).

One tool the researcher used to help establish credibility was to ensure triangulation of the data. Erlandson, et al. explicated that triangulation involves seeking data from different sources and different points of view to make sure all of the information coincides (1993). The researcher sought to triangulate the data through interviews with professional organizations in addition to faculty from various institutions under the Ministry of Agriculture. Large and small scale farmers were also consulted in short interviews. Document analysis also assisted in triangulation efforts. For example, respondent CI-1 failed to mention collaboration with AVFA, but a video clip shown during the interview proved to be taped by AVFA. The researcher was then able to inquire about the origin of the tape to discover that yes, a collaborative relationship did indeed exist between the two institutions. Document analysis was also used to verify the claims of respondents.

In addition, observation was used to triangulate data. This tool aided in clarifying any misunderstandings and allowed the researcher to dig deeper into some aspects of the study. Observations were written down in a daily journal.

### **Trustworthiness**

In qualitative research, trustworthiness of data is of utmost importance so that the credibility of the study will be established (Erlandson, et al., 1993). In addition to triangulation, the researcher collected “referential adequacy materials” to give readers an understanding of Tunisian agriculture through more than just her own words (Erlandson, et al., 1993). For example, she took pictures of farming life and extension activities. She also collected teaching brochures and other documents to show the work of agricultural institutions.

The researcher employed member checking as another trustworthiness technique, which simply means that she was able to make sure respondents really meant what they said (Erlandson, et al., 1993). The language barrier made member checking somewhat of a challenge, but the researcher simply asked questions in different ways to see if she would receive the same answer. She was able to return to certain respondents for clarification on some points, especially if they worked in or around INAT and spoke English.

Another trustworthiness technique is peer debriefing, which the researcher accomplished both in Tunisia and in Texas. According to Erlandson, et al., peer debriefing is the process by which the researcher shares her data with someone familiar



with the study to verify her findings (1993). Before the study began, the researcher met with the INAT professor assigned to help her to explain the context of the study. Then, as the findings emerged, she met with Dr. M'Naouer Djamelli again to insure that she was on the right track and to clear any misunderstandings she had about the system. The researcher transcribed the discussion, and a summary memo was written (Appendix D). After the researcher returned to the United States, and as she continued to organize her data, she met with a Texas A&M professor, Dr. Kim Dooley, to insure that her methods were sound and to discuss the process, working hypotheses, findings, and possible recommendations. Again, a summary of this peer debriefing session was written as a memo (Appendix D). These peer debriefing sessions provided valuable feedback to help guide the direction and progress of the study.

In addition, prolonged engagement is a method used to establish trustworthiness for the study. Prolonged engagement requires the researcher to stay in the setting long enough to overcome any misunderstandings or first impressions (Erlandson, et al., 1993). Therefore, initial interviews were conducted over a six-week period from May through June 2003. These interviews were conducted in the capitol of Tunis and throughout the country. Follow-up interviews were conducted in Texas during August and September 2003 with visiting Tunisians so that the researcher could verify some of the findings that were beginning to emerge from the data. The original six-week immersion allowed the researcher to observe the setting and culture over time. The entire prolonged engagement provided the researcher with enough time to interview thirty-seven respondents.

### Data Collection and Analysis

The researcher collected data by taking hand-written notes during interviews. Sometimes, a translator was used (at least partially), and sometimes the respondent spoke sufficient English to speak directly with the researcher. The researcher then transcribed these transcripts into typed files. An audit trail was created to track interviews (Appendix E). A coding system was used to identify respondents by agency while protecting their identity. Table 1 identifies the codes used during the study.

Table 1  
*Interview Code Identification*

Code	Interview
- EI-1 through EI-9	- Extension institution interview (AVFA)
- RI-1 through RI-4	- Research institution interview (INRAT)
- TI-1 through TI-3	- Teaching institution interview (INAT)
- AI-1 through AI-2	- Financial institution interview (APIA)
- GI-1 through GI-5	- <i>Groupement</i> interview
- CI-1 through CI-5	- Center interview
- PI-1 through PI-3	- Professional agency interview (UTAP, federations)
- TrI-1	- Training institution interview
- FI-1 through FI-3	- Farmer interview
- O-1 through O-	- Observation
- S-1 through S-	- Supporting Document
- PR-1	- Peer Debriefing with INAT professor
- PR-2	- Peer Debriefing with Texas A&M professor

The researcher then used the constant comparative method to analyze the data. This method, as defined by Erlandson et al., consists of the researcher breaking information into basic units and grouping these units into categories and then overall themes (1993). She began by breaking transcripts down into small bits of data and used a

colored highlighting system to divide these data “bits” into categories. She then grouped information in each category together to provide a big picture of the agricultural system from all sources of data. Information from these categories was then grouped into major themes to produce the findings in the study. The researcher compared these findings to available documents and previous research to develop recommendations.

In order to adequately answer the research questions, the researcher conducted a SWOT analysis (strengths, weaknesses, opportunities, and threats) on the findings. She paired strengths and opportunities to show positive influences and characteristics, and she paired weaknesses and threats to emphasize detriments to development. These findings are reported in Chapter IV.

## CHAPTER IV

### RESULTS

This chapter discusses the results of the study within the format of a SWOT analysis. Explanation of research findings begins with an overview of the system of Tunisian agricultural institutions as well as a description of the context in which the study occurred. I have included a case study of an imaginary, yet typical small farmer in Tunisia and detailed some of the issues he might face.

Let us suppose that Farmer Mohammed is a young farmer who wants help in making more profit from his land. He owns 10 hectares of land in the Governaurat of Adriana. He is farming the land passed down to him by his father, who farmed the land before him. Mohammed has a wife and two children who help him on the farm. In addition to a couple hectares of potatoes, he also has a grove of olive trees, four dairy cows, a horse, and a hectare of peach trees. Some of the land must be used to grow roughages for the dairy cattle. Mohammed, like most farmers in Tunisia, has suffered greatly in the past four years from the severe drought; however, this year, it has rained a sufficient amount to try to grow a more water-hungry crop. He will try strawberries because he heard from the other farmers at the *cafeteria* (coffee shop) that they will have a good price this year, if the middle men do not eat up all of the profits.

Mohammed took out a loan from the Bank of Tunisia ten years ago to buy three Holstein cattle from Germany, and he is still slowly paying this loan back. The drought really hurt his efforts, so the government stepped in to give him a couple extra years to

pay the loan. His small effort in dairy production is actually going fairly well. He milks the cows every morning and night, and he walks the milk in a canister to the nearby collection site to receive his 380 *millimes* per liter for about 8 liters of milk per day (about \$2.40 in US dollars per day). In September, he harvests a few of the olive trees himself to make olive oil for his family for the year, but harvesters come to take the rest of the olives away in exchange for a few *dinars* (the basic Tunisian currency for which one *dinar* equals roughly eighty US cents).

Mohammed's two daughters attend the local school, where they learn French in addition to the basic subjects. The girls don their pink frocks and walk to school every morning in the company of their friends. All of the children come home mid-day for a lunch of *couscous* (a wheat product), fruit, and possibly some *allousch* (lamb).

Mohammed's wife cooks three meals a day and keeps the house in order. The house is in a square shape around a central courtyard. The family has a small television that tunes in programs in Arabic, French, Italian, German, and even two English channels. The children like American movie stars, and they are beginning to learn a little English. Before they get to watch any TV, however, chores come first. The children help with the small tasks around the farm. The whole family's life is built around their little farm.

From what Mohammed remembers his father telling him about the French rule, Tunisian farmers are faring better than ever, but Mohammed still wonders if his family could do better. He wants his children to attend the university. He does not have to worry about costs because tuition is almost free, but how will his children get there and afford a place to live in the city?

A man from some government institution has come by the farm a few times. He claims to want to help, but Mohammed is not sure he can trust this man. All government people are alike. They come in these white government cars with their fancy clothes on. Some come to collect more taxes, and some claim they can help. Maybe they want to help so they can collect more taxes! Who is a farmer supposed to trust? Mohammed lies in bed late at night, trying to figure out what to do. There is some sort of farmer organization that is meeting tomorrow night. Maybe he will go to that meeting and ask around for ideas. Surely the government man has been to other farms as well.

This case study provides a picture of issues a typical farmer might experience in Tunisia. The following overview provides general information about agricultural institutions and their interrelationships.

### **Overview of the System**

In order to understand the findings and recommendations ensuing from this study, the reader must understand the context in which the study was conducted. Many institutions, most under the control of the Ministry of Agriculture, worked to support the Tunisian agricultural industry. Some were effective in meeting their responsibilities, and some needed improvement. The following overview provides a look inside the workings of the institutions responsible for guiding agricultural development.

In the mid 1990's, Tunisia's per capita income reached the \$6,000 mark, which artificially caused it to be labeled as a second world country verses a developing country. Because Tunisia had been so successful in raising itself out of poverty, outside and

international organizations began to pull out. The Peace Corps left around 1995, and USAID and other aid organizations soon followed suit. The Tunisian government itself now felt responsible to fill the voids left by this exodus. Because farmers had been relying on the other institutions thus far, the government just stepped in and continued to hand feed them.

Tunisia is a small country at the Northern tip of Africa that is about the size of the state of Georgia in the United States. As of 2003, It boasted a population of 11 million people, and 99% of the population claimed Arabic descent. For such a small country, it exported a great amount of olive oil, dates, and other agricultural products. Its relationship with the United States was not near capacity, but Tunisia maintained good relationships with European countries and worked to develop these alliances more fully.

Tunisian farmers were generally categorized into one of three groups, and these groups were often mentioned as specific target audiences (EI-7). Eighty percent of Tunisian farmers were considered “small,” and these farmers needed information and the opportunity to cooperate with each other (RI-3). The middle and large farmers made up the other twenty percent. Middle farmers owned slightly larger farms, and some had the opportunity to become large enterprises if they could receive the information they needed to expand their farms (EI-7). The very few large farms, or “societies,” used more advanced methods and technology (EI-7). There was a huge difference in the function and needs of the small verses large farmers.

The Ministry of Agriculture was the overarching authority in agriculture, and all agricultural institutions were connected in some way to the ministry. The country was

divided into 24 governaurats, similar to provinces. Within each governaurat, an office called *Commissariat Regional Development Agricole* (CRDA) was responsible for all government action concerning agriculture and acted as a “miniature” ministry of agriculture for that region. There were 5 divisions within each CRDA:

- Administration and Financial Affairs
- Hydraulic and Rural Equipment
- Forestry and Soil Conservation
- Study
- Extension and Agricultural Development (EI-1).

Under the Ministry of Agriculture, the *Institution de le Recherché et de l'Enseignement Superieur Agricoles* (IRESA) acted as the institution responsible for research and higher education for agriculture fields. In the past, agriculture universities and research were not linked under the same name, but in 1999, all nine universities and all four research institutions were linked under one organization (RI-3, PR-1). The four research institutions included:

- INRAT (agricultural research institute)
- INGRES (forestry research institute)
- Institute of Olives
- IRVT (vetinary research institute)

Due to this merger, agriculture universities such as INAT could now work directly with researchers.



Within the universities and research institutions, research activities were organized into ten domains, and each domain contained research projects. Each research project consisted of specific actions (RI-2). Each domain was guided by a *Commission de Programmation et d'Evaluation de la Recherche Agricole* (CPERA). These commissions were made up of 15-20 people representing research, professionals, groupments, and the professional organization. Groupments, as explained in more detail later, were the government organizations that promoted specific agricultural products, such as dates. The responsibility of the commissions was to evaluate and monitor research activities (RI-2). For example, they ensured objectives were clear and evaluated preliminary results of long-term projects (RI-2). One main activity of IRESA was to organize an annual seminar to report the research results of the past year to all interested agriculturalists, including students, researchers, professors, and extension agents.

Yet another institution under the direction of the Ministry of Agriculture was the *Agence de Promotion des Investissements Agricoles* (APIA), which helped farmers obtain funding. They coordinated loans for farmers from the Bank of Tunisia. Farmers could also come to APIA with new ideas; APIA professionals helped farmers determine the viability of the idea (AI-1). During times of economic hardship, such as the drought of 2000-2002, APIA worked with the national government to reorganize loan repayment plans. APIA directed its efforts from a main office in Tunis, but it had regional offices for better farmer access (AI-2).

*Groupements* also worked to assist farmers, but they operated at an industry level. *Groupements* were organizations within the Ministry of Agriculture that promoted

a specific commodity. For example, vegetable, grape, date, and fruit *groupements* were housed within separate Tunis offices (but they were in close proximity to each other). They tried to alleviate problems and develop better markets. For example, the date *groupement* faced a national problem with a certain worm that ate dates. They had not been able to identify the worm or any way to control them yet (GI-4). The *groupements* worked to establish export markets and planned to expand international trade relationships.

In an effort to encourage practical, applied research, the Ministry of Agriculture created “centers” for specific agricultural commodities during the mid-1990’s. Unlike *groupements*, these centers focused on the farmer level and how to solve real and contemporary problems for farmers. Examples of centers included the Potato Center, the *Centre Technique Des Cereales*, and a center for studying organic farming techniques. According to one respondent, basic research was completed in research institutions, and it became applied research at the centers (CI-3). The center employees began with small test plots, moved the research to larger plots, and finally tested research results in farmers’ fields. For example, the *Centre Technique Des Cereales* worked with the agricultural university at Kef to develop better varieties of wheat and other grains for Tunisian farmers (CI-3). The centers work with the various agricultural institutions to turn research into usable results (CI-4).

The *Agence de la Vulgarisation et de la Formation Agricoles*, or AVFA (The Agency of Extension and Training in Agriculture), was responsible for extending knowledge to farmers and fishermen and providing training (educational) opportunities

for them. Agency administration resided in Tunis, and each *gouvernement* was divided into 6-12 regional *Cellule Territoriale de Vulgarisationes* (CTV's). Each CTV was further divided into local *Centers de Rayonnement Agricoles* (CRA's). These were the smallest Extension units, and a government extension agent worked in each of the 830 CRA's in Tunisia. The organization of the national office for AVFA included five directions:

- Division of Operation of Extension
- Training
- Pedagogy
- Private Extension
- Fishing Sector.

Somewhat separated from the administration of the ministry, *l'Union Tunisienne de l'Agriculture et de la Peche* (UTAP), was the professional agricultural organization for farmers. It was established in 1950 to act as a "spokesman for farmers" (PI-1). The organization claimed many objectives, including promoting agriculture, keeping farmers informed, and organizing national and international fairs, exhibitions, and partnerships (PI-1). There was a local union in each *gouvernement* to act as a regional representative, and "federations" for specific commodities acted on behalf of farmer interests. For example, federations for cereals, dates, citrus, tomatoes, or olive oil may have met once per month or when a problem existed (PI-1). UTAP also strove to form cooperatives to help farmers obtain supplies, such as seeds or fertilizer. UTAP representatives also worked to nurture international relationships and develop partnerships between Tunisian

farmers and professionals in other countries (PI-1). UTAP was funded by the Ministry of Agriculture, “other” institutions, and a small percentage came from the farmers themselves (PI-1).

All of these institutions worked together with the shared general, although somewhat disjunctive, goal of promoting and increasing agricultural productivity and profitability within Tunisia. They were tied together in a complex web of communication. Some institutions, such as the INAT and INRAT, worked directly together, while others like the Potato Center and AVFA had indirect links. Teaching and research efforts were under the same umbrella of authority, but extension did not have a direct communication link to them. These communication issues are discussed in greater detail further into the chapter.

Now that the foundation of the Tunisian agriculture system has been laid, the researcher uses the SWOT model of evaluation to identify the strengths, weaknesses, opportunities, and threats facing this system. This model is a useful tool for evaluation because it examines both inside and outside influences, whether positive or negative, on a system. It is a holistic approach to evaluation. The researcher also chose to pair strengths and opportunities because these were the influences that encouraged an effective and working system. They also aided diffusion of innovations through the system. Weaknesses and threats were also paired because these were influences detrimental to agricultural development in Tunisia. The researcher also sought to answer the research questions addressed in the study. Therefore, the results are organized by research questions.

## Research Question 1

**What are the strengths (internal influences) and opportunities (external influences) that encourage development in Tunisia within the context of agricultural institutions?**

### *Strengths*

The first strength to be mentioned is that Tunisia did have a **functioning system for agriculture**. This fact may seem obvious to people from developed countries, but considering Tunisia gained its independence only 50 years ago, this was a true accomplishment to be applauded. Someone, in the very beginning of an independent nation, had the foresight to invest in the future of agriculture. Years later, Tunisia reaped the benefits of that vision. Other countries who have shared similar histories to Tunisia have not experienced such success. For example, Libya had no ministry of agriculture to speak of and thus has no focused effort to increase agricultural productivity as a nation (TI-4). Tunisia avoided this problem by investment in an agriculture structure early on in its history (PR-1). The government also encouraged farming through monetary and other support (AI-1, AI-2, PR-1). Opinions varied on the effectiveness of this structure, but the fact remains that Tunisia had a system to work with in the first place.

A strength of the agriculture system was the **focus on meeting farmer needs**, at least in theory. Many respondents mentioned meeting farmer needs as a main goal of their institution (EI-1, EI-2, EI-5, EI-6). These respondents focused on starting with an assessment of farmer needs at the local level and moving up the chain through the

regional level and finally to national policy (EI-1, EI-3, EI-5). One respondent emphasized developing appropriate programs for farmers (PI-1). Another respondent concurred:

Farmers think the same all over the world. [It is the] only job that you can't control the production condition. Farmers are the only men who can quantify risk. This is the difference between research technicians and the farmers.

Research is in controlled conditions. If you work in real conditions, it is different. (PI-2).

Farmer needs included more than just financial help. Agriculture was one of the main pillars upon which the Tunisian society was based. Agriculture was more than just another industry; it was the focal point around which many of Tunisians' daily lives rotate (RI-3). The government encouraged farming as much from a social point of view as an economic one (PR-1, RI-3).

One specific action taken to meet farmer needs was the creation of the **research and extension centers** to address the issues of specific industries. These centers were the most effective agencies to integrate teaching, research, and extension. They worked directly with farmers to identify needs as well as to educate them. This direct link to the farmers guided the success of the centers. For example, the Potato Center employees convinced a volunteer farmer to plant rows of different potato varieties. Periodically, the local farmers would gather to study the progress. I traveled with the Potato Center personnel to meet with the farmers for the last field day of the season. About twenty people gathered at the field, including commercial representatives, researchers,

extension agents, and, of course, the farmers themselves. The center employees dug up the plots to reveal the yields of the different varieties. They also used posters to explain the differences in varieties as well as the advantages and disadvantages of each. The farmers listened to their advice, and they could make informed decisions from what they heard and saw for themselves (O-1). In addition to field days, the centers also hosted workshops where farmers could come to their facilities for several days. The centers even built small dormitories, a cafeteria, and classrooms to support educational programs (CI-1).

The centers also collaborated with researchers to obtain effective results from applied research. The Wheat Center transformed preliminary results into useful information. For example, center personnel planted new varieties first into small test plots and then into larger fields so that they could be tested under real conditions. The centers were the best example I found in Tunisia where teaching, research, and extension all played an active role in the function and purpose of the organization. The centers even worked with university students to help them learn in real-life situations (CI-3).

The **university system** itself was also a strength for Tunisia. School attendance was required for every child, male or female, no matter where they lived. One respondent claimed that in some rural areas, residents did not yet have the convenience of electricity, but the children attended school, beginning at age six. Basic education was a free and mandatory government service (RI-3).

Training at the university was adequate to provide students with the knowledge, skills and abilities necessary to work in the agriculture profession (TI-1, PR-1). The nine

agriculture universities in Tunisia maintained the goal of preparing the next generation of agriculturalists for the future. The higher education system was also virtually free. Graduate students paid about 100 *dinar* (\$80) per year to attend the university, and undergraduates paid nothing (TI-1, RI-3).

Respondent TI-1 explained the higher education system. Students at any university spent their first two years studying basics, such as science, math, French, English, and history. After two years, they took a challenging, 4-day national exam to move onto a more specialized field. The students' specialization was chosen through a consideration of the student's interests, needs of Tunisia, and industry trends. After three years of specialized study, the typical INAT student graduated and earned the title of "engineer." If (s)he wished to continue studying, the student could move onto a masters (two years) and eventually, doctorate (4 years). If a young adult chose not to attend a university, (s)he had the option of attending a technical school (TI-1). For example, I visited with instructors from the fishing school in Kelibia, and they were dedicated to keeping that industry a strength of the agricultural system (O-2).

Under the guidance of IRESA, the research institution INRAT and the university system INAT worked together to conduct research and train students. Many researchers were students as well, and students became qualified researchers. Institutions underneath the IRESA umbrella seemed to share information more readily amongst themselves than those institutions outside the realm of IRESA. No respondents could tell me why AVFA was not included in the creation of IRESA.



Yet another strength of the Tunisian system of agriculture was the **emphasis on diversity, specifically in regard to women**. There were a few international students at INAT other than me, and most of them were from other African countries. I was the first American to come to INAT to study. Both students and faculty from INAT were impeccable hosts, although looking back at pictures, I stood out more than I had realized with my blue eyes and light skin. Although I was a lone American woman in an Arabic country during the aftermath of the Iraq war, I was always treated with the utmost kindness and respect (O-3). One professor even hosted some extension professionals from another African nation to show Tunisian methods and success stories in agriculture (O-4).

Tunisia's first president, Bourguiba, possessed the insight to emphasize women's rights, especially in regard to education. Despite retribution from other Arab nations, Tunisia pursued activities to increase the quality of life for all people, especially women. Due to this emphasis, women have been able to contribute to the workforce and development of the country. Women were involved in many of the levels of administration and teaching throughout the system. Forty percent of the professors at INAT are women (TI-3). Tunisians were proud that they lived in the only Arabic nation where the wife could divorce her husband and retain custody of the children (RI-3). "Women's Day" was even celebrated every August 13 to honor women. A special law was passed on this day to further help women. One respondent joked that there was no "Men's Day" (RI-3). AVFA worked on a special project to teach specifically to women about agriculture (EI-1, RI-3). This pilot test was implemented into six *gouvernaurats*

(EI-1). As women possessed specific roles on the farm and in society, specific efforts were made to meet their educational needs. Tunisia had taken a huge step in this direction, and respondents were enthusiastic about future possibilities.

Tunisians **looked toward the future through attempts to improve the agriculture system**. For example, the government attempted to alleviate the pressure on AVFA and the farmer's dependence on the government through privatization of some extension efforts. Many efforts were made to further mechanize agriculture as well as to continually increase productivity and profitability. These attempts were a strength and a sign of willingness to change.

One avenue for this change was the greater amount of **extension programming offered through the professional organization**. UTAP itself realized this need and rose to the call. In order to face new economic challenges, the 11<sup>th</sup> Congress of UTAP created the department of Technology and Economic Affairs in 1995. This department was responsible for promoting the farming sector and meeting the training needs of farmers (PI-1). Educational activities included a traveling audio-visual presentation, transporting farmers to visit seminars and "pilot models of success," simple brochures, and other publications (PI-1). These methods were used to fill in the gaps the organization felt AVFA left (PI-1).

UTAP also provided farmer contact to the government (PI-1). Local groups of UTAP members, called federations, were highly effective in communicating with the farmers (EI-9). Federations acted as an avenue of conveying the latest policy information to the farmers from the national leadership as well as bringing local farmer needs to the

attention of the Ministry of Agriculture. When asked how he learned about agriculture trends and updates, one farmer recalled that he received information through his local federation (TI-3).

Furthermore, the **fishing sector** itself contributed a great deal to the Tunisian agriculture system. The fishing sector was forward-thinking and eager to develop international relationships. Every respondent from the fishing sector emphasized technological development and international collaboration (TrI-1). Fishing sector respondents from the training center and extension were willing to confide system weaknesses to the researcher and share the problems they face. For example, one lingering issue was that farmers' sons came to be trained, but they did not really care about fishing themselves. They were not willing to work as hard as the industry required. Fishing sector respondents also noted technological advances they were experimenting with or would like to implement (TrI-1).

There was an attempt to use **various methods to convey useful information** to farmers. Progress is being made in citrus production (EI-8). Tunisia was actually the first Mediterranean country to use drip irrigation on potatoes (PI-2). Drip irrigation was used throughout the country and especially in the south to help transform the desert into an important agriculture region with a larger variety of crops. Table 2 provides a summary of the strengths of the Tunisian agricultural system identified in the study.

Table 2

*Summary of Strengths of the Tunisian Agriculture System*

Strengths
- Functioning agriculture system
- Focus on meeting farmer needs
- Research and extension centers
- University system
- Emphasis on diversity, specifically in regard to women
- Looked toward the future through attempts to improve the agriculture system
- Extension programming offered through the professional organization
- Fishing sector
- Various methods to convey useful information

*Opportunities*

The most prominent opportunity for Tunisia involved many small opportunities, or innovations. As the world continues to “shrink,” especially concerning access to information, this small country could take advantage of the work of other countries. abounded the age of globalization. One respondent discussed the opportunities **Technological innovations** provided through innovation, but he cautioned that change agents must keep in mind costs as well as replicability when attempting to introduce new ideas into the agriculture sector (RI-1). Tunisian researchers had the opportunity to benefit from technologies developed by other countries. Researchers from INRAT have traveled to the US to study experimental techniques at Texas A&M (RI-3).

Many respondents spoke of meeting farmer needs as a priority for them personally as well as for the organization they represented. They felt that there was great opportunity in **working with farmers and encouraging them to work together**. Some respondents claimed that their institution attempted to organize farmers so that they

could see results for themselves (FI-2, PI-1, CI-1). A couple respondents mentioned they used obvious leaders (opinion leaders, although the term was not used) to disseminate information to other farmers (GI-1, CI-3).

Farmer needs were considered in theory, and many respondents mentioned their importance (EI-1, EI-9, TI-1), but the system may be missing out on some crucial resources, mainly the farmers themselves. For example, AVFA attempts to meet farmer needs through directing the flow of communication from farmers through local extension agents to the regional directors and eventually the national office (EI-1). UTAP also mentions attention to farmer needs through direct communication with farmers at scheduled demonstrations and meetings (PI-1). The bi-annual meetings also give farmers an opportunity to express their needs. The problem occurs when farmer needs are not in juxtaposition with national priorities. The Ministry of Agriculture faced this dilemma in several areas – individual farmer interests must be defended while the nation as a whole must be taken care of. Other obstacles to this opportunity include the fact that some change agents do not know how to communicate with farmers (RI-1).

However, change agents have begun to view **farmers as an integral tool for agricultural development**. These educators understood that farmers had a wealth of experience and information from which to offer their own advice and help. For example, the potato center brought farmers together to the field of a certain opinion leader. After the professional educators talked some, they stepped back and let the farmers discuss amongst themselves which varieties they supported. This interaction allowed both the

professionals and the farmers to communicate as experts in their own fields and learn from each other (O-5). This interaction is an opportunity and resource for development.

Tunisia made a step in the right direction with regard to **developing relationships with other countries**. Almost every respondent mentioned some contact with other countries. The main country of contact was obviously France, followed by other European countries. The fishing industry built relationships with Italy and Japan, and these countries exchanged ideas and experts (EI-6, TrI-1, AI-2). The *groupements* strove to increase exports and profitability through international collaboration (GI-2, GI-3, GI-1), and UTAP also helped farmers develop international partnerships (GI-1). APIA encouraged development of relationships between Tunisian farmers and private industry in other countries (AI-2). The breeding and genetics station at Sidi Thabet imported semen from the US and Europe to improve the genetic quality of Tunisian cattle breeds (CI-4). Many respondents mentioned attending international shows to learn about worldwide action and innovations concerning their field of study (GI-4, GI-5). UTAP even hosted an international show every two years (PI-1). Surprisingly, few respondents spoke of working with African or other Arabic countries in trade or the exchange of ideas.

Not surprisingly, Tunisian agricultural institutions did not have a **consistent relationship with the U.S.**; however, several respondents mentioned the desire to develop this relationship (CI-3). INAT already set the example in this direction through the collaboration with Texas A&M. One of the *groupements* also expressed interest in working with the U.S. (GI-1). A respondent from the cereal center commented that there

had been collaboration with the U.S. in the past (CI-3). These relationships had dwindled due to lack of funding, but the interest was still there, as least from the Tunisian viewpoint (CI-3). The efforts in international contact were a great asset to the development of Tunisian agriculture.

Another opportunity for Tunisian agriculture was to take advantage of their **proximity to Europe** in conjunction with their earlier growing seasons. Tunisia's fruit ripen earlier than in Europe, so Tunisia could take advantage of the better prices before the full season begins (AI-2). Table 3 summarizes the opportunities available to the Tunisian agriculture system that were found during the study.

Table 3  
*Summary of Opportunities for the Tunisian Agriculture System*

Opportunities
- Technological innovations
- Working with farmers and encouraging them to work together
- Farmers as an integral tool of agricultural development
- Developing relationships with other countries
- Consistent relationship with the U.S.
- Proximity to Europe

## Research Question 2

**What are the weaknesses and threats that hinder diffusion of innovations within the Tunisian agricultural system?**

### *Weaknesses*

History and tradition played a major role in the organization of the agriculture system. I found that many of the respondents were hesitant to provide any real feedback beyond spelling out for me the obvious responsibilities and successes of the organization or institution. It took some encouragement from a professor at INAT and some creative interview skills to dig a little deeper past the outer shell. After one particular interview, my translator mentioned to me that one person from the organization had mentioned a problem for that organization, but his fellow respondent interrupted and asked him not to share any further about that problem (O-6). I also noticed that as I was given tours throughout the country, I was taken to the best farms and the showcase *gouvernaurats* and government projects.

A few times, I did break through to discover that the system did have some weaknesses. One respondent repeatedly told me that he was very limited in what he could talk about; however, after a few “warm up” questions, he did eventually share some deeper thoughts (GI-1). One respondent did admit that respondents from a different organization would deny their weaknesses, and he also admitted the weaknesses of his own institution (RI-1).

The traditions of the society itself also denied its citizens the right to speak freely and express their opinions without fear. Some of this impression upon me as the researcher came from the fact that I was an outsider. Most government officials hung a picture of Tunisia’s current president on the wall of their office (O-7). Some had other decor as well, but even if they did not have anything else on the wall, they had a picture



of Zine el-Abidine ben Ali. I never heard one negative comment about the head government officials or disagreement with the opinions of top administration (O-8). Ben Ali had the power to veto any legislation, and he kept a tight reign over every aspect of government. This closed fist might have been the result of how much effort was required to keep a second world, Arabic nation peaceful. Also, if Ben Ali wished to stay in power, he must make sure that no single official could gain enough support to overtake him, which is exactly what Ben Ali did to Bourguiba in 1987.

This tight fist was partly to blame for the biggest weakness of the Tunisian agriculture system – **excessive government involvement**. Ironically, this involvement benefited Tunisia the most after independence in the 1950's. Tunisian farmers needed government involvement from the beginning as a jumpstart and because they had a low level of technical knowledge for innovations (EI-2). However, as the country developed, the government held too tightly to its control and did not let farmers take more ownership of their industry. Just as most non-governmental organizations (NGO's) and international aid projects pulled out of Tunisia during the mid-1990's due to the self-sufficiency of the agriculture sector, Tunisia's own government needed to do the same (EI-1). The government was over-involved, and it could not be all things to all people (EI-9). The Ministry of Agriculture decided how to set prices (GI-1), financed the professional organization (PI-1), and supervised all extension efforts (EI-2). One respondent concluded, "The U.S. government attempts to limit agricultural productivity by paying farmers not to produce, but the U.S. continues to have surpluses. In

developing countries, the government works to increase production, but their people still go hungry. What is the conclusion? Governments can't farm" (TI-4).

Some respondents felt farmers had a "passive" attitude and would just wait for the government to help (EI-2). Other respondents felt that farmers would, indeed, help themselves if given the opportunity (RI-1, PR-1). The national administration was already enlightened to this fact, as proved by the attempt to involve the "professional" organization in decisions and activities. However, the national professional organization, UTAP, was still funded (at least in part) by the government (PI-1). UTAP's local federations were actually farmer-led, but they were the only such organizations in the entire country. Federations were local professional organizations of farmers within the same commodity, and these were effective to increase communication to farmers (EI-9). However, through their connection to UTAP, these federations were still linked to government control. In addition, even when a federation attempted to address an issue, the government still maintained authority. For example, a federation was created to deal with water issues for a certain community, but the national government still maintained control of water resources (EI-9).

No large-scale breeding programs run by farmers existed, nor did any independent breed associations function (RI-3). Many farmers already followed steps to help themselves (FI-1), and they would accomplish more if the government would stop force-feeding them. One respondent felt that **independent farmer organizations** would promote issues farmers identify in ways farmers approve of with farmer buy-in (RI-3).

AVFA also attempted to decrease government involvement by “privatizing” some extension activities, mostly through an effort to create 60 new, “**private**” **extension agent positions**, who would offer advice to farmers for a fixed fee (EI-2). However, these private agents would not be not fully private because they would still be under the authority of the government and receive their training from government institutions (EI-7). The private extension agents would focus their efforts on reaching the largest twenty percent of farmers, those who were able to pay for services. This plan was not currently implemented, although AVFA appointed a new director to oversee private extension.

The spotlight was also on “**professional**” **extension programs** offered by UTAP (EI-9), and these extension agents were supposedly not paid by the government (EI-7). However, UTAP was ultimately financed by the national government (PI-1). Again, the government was stepping in to control the very program they were attempting release from their oversight.

In addition to the fact that the national government hired, trained, and controlled supposed “private” extension agents, the concept itself was not workable. Large farmers already had advisors they go to for information, and these relationships were built over a number of years with specific experts they trusted. One farmer worked closely with a professor from INAT (FI-3). Another chose a close friend and field expert as his advisor, and he also surfed the Internet to find information from U.S. universities (FI-1). However, most small farmers did not have this luxury. Some did have help from government employees, but many were left behind without any help.

**Lack of formal accountability** was also a weakness of the Tunisian agriculture system. Many government employees did not have any quotas to fill or any requirements for reporting their accomplishments. Some employees worked tirelessly to help farmers and other agriculturalists in any way they could, but some employees had a nonchalant attitude toward their work (TI-1). With no reporting system, it was difficult to hold employees accountable and to prove whether they were actually fulfilling their responsibilities or not. Several respondents noted that if someone landed a government position, it was virtually impossible for them to lose their job, regardless of their performance.

After weeks of observation and interviews, it became increasingly obvious to me that the employees within the Tunisian agriculture system had **no mechanism for organized, formal training in extension and educational methods**. INAT did not offer a degree in agricultural education (TI-3), and if a Tunisian wished to earn a degree in this field, he or she must study abroad (GI-4). Extension agents had bachelor's degrees in such subjects as agronomy or animal science, but they were not been trained on how to relate this information to their clientele, the farmers (EI-7). Change agents from any institution need certain technical skills, but it is also essential that they realize that developing relationships with the farmers is just as important (EI-7). The extension institution at Sidi Thabet offered some training in methodology, but if the agents wished to really help the farmers, they must receive specialized training in how to do so (EI-7). Table 4 summarizes the weaknesses of the Tunisian agriculture system the researcher found during the study.

Table 4  
*Summary of Weaknesses of the Tunisian Agriculture System*

Weaknesses
- Excessive government involvement
- Lack of independent farmer organizations
- Unrealistic “private” and “professional” extension efforts
- Lack of formal accountability
- No mechanism for organized, formal training in extension and educational methods

### ***Threats***

Although Tunisia has experienced exponential economic growth since its independence, this country still struggled to increase its per capita GDP and become more profitable, as is the goal of most countries. As Tunisia also joined the ranks of countries struggling to be profitable in this global market, its people realized that as they grew, so did other countries (AI-2). The **competition was very tight**, and it was difficult to pull ahead in any arena.

**European import policies** were also a detriment to agricultural development, especially as the global economic downturn affected even the smallest of exports. Europe wanted to protect its own markets, so it placed more restrictions and higher taxes on Tunisian fruit and other exports (FI-1). Farmers felt that it was more profitable to give up on the global market and simply sell their product within Tunisia (FI-1). Olive producers also struggled to compete with the European market. One problem occurred when Tunisian farmers sold their products to Italy and other European countries, and these countries marketed Tunisian products under their own label. The wine industry

took the initiative to introduce Tunisian wine labels and other marketing techniques (GI-2), but other markets impeded the advancement of Tunisian products.

**Water** was also a threat to continued efforts in agricultural development. In this arid climate (and desert in the south), water was a treasured and scarce resource. Most agricultural production required irrigation, and drip irrigation systems were extremely popular. Dams were built to help store and transport water, but these reservoirs were largely under capacity without any hope of filling up, due to water seeping slowly into the ground (TI-1). Although Tunisia had miles of coastline, water was also a problem because the quality was poor in many places (CI-1). High levels of salt were a problem because before policies were created to regulate water use, farmers dug deep wells and used excessive amount of fresh water (PI-1, FI-1). Salt water displaced the fresh water, and crops were not adapted to this condition (CI-1). Efforts were made to alleviate both quantity and quality issues, but the problem persisted. Table 5 summarizes the threats facing the Tunisian agriculture system

Table 5  
*Summary of Threats to the Tunisian Agriculture System*

Threats
- Tight international competition
- European import policies
- Water quality and quantity

### Research Question 3

#### **What are the communication networks that support the function of agricultural institutions in Tunisia?**

All of the strengths, weaknesses, opportunities, and threats of the Tunisian agricultural system are exemplified together in the communication networks within the system.

Some of the communication was great, such as the system the grape *groupment* used to alert all vineyards within Tunisia about new diseases or other dangers facing their industry (GI-2). Their system involved a series of stations and computers to transfer information quickly throughout the country. Federations were also successful in the diffusion of information to the local farmers (EI-9).

Communication between agricultural institutions in Tunisia was at best informal and at worst, disorganized and sporadic. It was impossible to determine exact communication structures or links, especially considering the organization of the government institutions. I attempted to ask respondents about whom they specifically communicated with, but the common response was, "We communicate with everyone." In addition, meetings with various institutions were set up for me through faxes. About half of the time, confusion ensued when I arrived for interviews due to people not receiving the fax or the right person not being informed of my presence. Most of the time, it took awhile for the right people to find me or for the respondent to remember, "Oh, *that* fax!" Sometimes, vital communication did not occur at all (O-9). On several occasions, the two representatives from AVFA assigned to escort, introduce, and

translate for me asked their own questions of the respondents and were learning about their own organization along with me (O-10). I was surprised that they did not know the job descriptions of their colleagues or some of the activities of the organization.

Another disjoint in communication occurred through the separation of extension efforts from research and teaching institutions. Joining teaching and research together under IRESA improved communication and the effectiveness of these organizations, but AVFA still had no direct connections. Tunisians realized the need for all three to work together. One respondent pointed out that “agricultural teaching, research, and extension technicians need to make the third category more effective” (EI-7). Another respondent concurred that the most important effort these organizations could make was to work together in order to do a better job of informing farmers (RI-2). The responsibilities of each organization needed to be clear, and each organization had to do their job in order for the system to function effectively (RI-2).

From this conglomeration of information, several conclusions and recommendations can be made for the benefit of Tunisian agriculture leader and other individuals and organizations interested in improving agriculture systems, whether in Tunisia or another country. Chapter V gives a summary of the findings, conclusions ensuing from the findings, and recommendations based on the study.



## CHAPTER V

### SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

The purpose of the study was to evaluate the agricultural teaching, research, and extension institutions in Tunisia in order to determine the effectiveness of the diffusion of innovations from these institutions and how this leads to agricultural and economic development within the country. This study was conducted in collaboration with the International Agriculture program at Texas A&M University and the *Institute National Agronomique de Tunisie* (INAT).

Data collected from thirty-seven participants in various positions (from professors to farmers) in various locations (from the very north to the southern parts) within Tunisia were analyzed and organized into a thesis. This data can be used by Tunisian leaders in agriculture to plan further development efforts for the country. Information from this study can also be used to help those interested in aiding development in countries facing similar situations as Tunisia.

Four research questions were developed to direct the progression of this study.

1. What are the strengths (internal influences) and opportunities (external influences) that encourage development in Tunisia within the context of agricultural institutions?
2. What are the weaknesses (internal influences) and threats (external influences) that inhibit development in Tunisia within the context of agricultural institutions?

3. How do communication networks function to promote the flow of knowledge from research and teaching, through extension, to the farmers and then from farmers to these institutions?

### **Summary of Methodology**

This study evolved out of the collaborative efforts between Texas A&M and INAT. INAT sent several students and faculty members to Texas, so Texas A&M was now ready to send a student to Tunisia for study. During conversations between the researcher, faculty at Texas A&M, and faculty from INAT, the need for and interest in this study was discussed. Specific objectives were then developed, details organized, and the researcher was on her way to spend the summer of 2003 in Tunisia.

This study was qualitative in nature, using naturalistic inquiry (Lincoln & Guba, 1985), and this approach allowed the researcher to gain specific insight and details into the functions of the agricultural institutions. Data collection began with document analysis of pertinent information concerning the diffusion of agricultural knowledge in Tunisia. The researcher collected data through face-to-face interviews with a purposive sample of the population. Respondents were initially identified with the help of the president of INAT, who acted as a gatekeeper to help the researcher gain access to the first respondents, after which snowball sampling was used to gain further access.

Data from clientele, faculty interviews, and support documents triangulated the data. The researcher wanted to provide multiple perspectives and viewpoints from the people who were affected by agricultural institutions, from administrators to farmers.

Trustworthiness techniques used included prolonged engagement, persistent observation, triangulation, reference adequacy materials, peer debriefing, and member checking.

The constant comparative method was used to analyze the data. From the categories and themes, the researcher was able to extract results and findings from the study. These findings were viewed from the perspective of the strengths and opportunities that encourage agricultural development in Tunisia and the weaknesses and threats that hinder the effectiveness of agricultural institutions.

### **Summary of Findings**

The findings from this study were organized according to the four research questions that guided the study.

#### ***Research Question 1***

*What are the strengths (internal influences) and opportunities (external influences) that encourage development in Tunisia within the context of agricultural institutions?*

Respondents eagerly discussed their successes and what they perceived to be the strengths of the agriculture system, specifically within agricultural institutions. Some of the strengths came from documentation and observations of the system as well:

- Tunisia had a functioning agriculture system that has been integral to its progress in development from independence to the current situation. Investment in agriculture was encouraged at the nation's inception in 1957.

- The majority of faculty in agricultural institutions understood the importance of meeting farmer needs and developing programs to meet those needs.
- Research and extension centers dotting across the Tunisian map work to combine applied research and extension methods and act as a functioning link between research and the ultimate clientele – farmers.
- Education was a definite strength of Tunisia as a whole, as well as specifically in agriculture. The majority of children attended school, even in the rural areas. University education was practically free, and the universities work hand in hand with researchers.
- Equality of women was yet another striking strength of Tunisia. Women could vote, and a Women's Day is devoted to the celebration of women.
- Agricultural institutions were looking to the future and how the agriculture system could be further improved, specifically in the way that extension functions. They were also exploring various methods of disseminating information to clientele.

Opportunities for further development in Tunisia also abounded.

- Globalization allowed Tunisia to take advantage of innovations that they did not have to produce themselves and to broaden their information base from which to encourage diffusion of innovations.
- International collaboration helped Tunisians gain more information and learn from other experiences, specifically with the United States.
- Proximity to Europe allowed Tunisians to take advantage of their markets.

- Earlier harvest timing and the development of varieties that could be harvested in the off-season helped with international trade and increasing profits.

### ***Research Question 2***

*What are the weaknesses (internal influences) and threats (external influences) that inhibit development in Tunisia within the context of agricultural institutions?*

Every system of agricultural institutions faces weaknesses. Those within the Tunisian system included:

- A tradition of discouraging discussion and recognition of weaknesses, specifically with outsiders, was prevalent within many of the agricultural institutions.
- The government kept a tight reign on the people's limited freedoms. Development was hindered because the people were not encouraged think for themselves and thus developed a passive attitude toward their jobs and helping themselves.
- Largely due to government control, no independent agricultural organizations of farmers existed so that farmers could help themselves (example: no breed associations).
- Attempts to privatize extension needed improvement, and the professional extension was controlled by the government.
- There was a lack of a formal accountability and evaluation system to mark progress or recognize areas for improvement.

- Formal training in extension methods was lacking; there were no agricultural education programs at the university level.

Outside threats were also a detriment to continued development in Tunisia. These included:

- Worldwide competition was rampant for the same products that Tunisia hopes to use as exports.
- European policies were more lenient toward Tunisian exports, except in the area of agricultural products.
- Sufficient water was a continued threat to Tunisian agriculture.

### ***Research Question #3***

*How do communication networks function to promote the flow of knowledge from research and teaching, through extension, to the farmers and then from farmers to these institutions?*

Some communication networks were advanced and allowed rapid flow of information; however, many of the communication channels in the agriculture system were disorganized. The researcher's attempts to link organizations resulted in a spider web of connectivity, with some necessary links weak or completely missing. Specific people involved with most agricultural institutions could not describe the communication process within their organization.

Another weakness of the communication network was that research and the universities were connected through an umbrella organization (IRESA). However,

extension is not included and was therefore left out of the loop in consideration of the information that was offered.

### **Conclusions**

Tunisia's agricultural institutions and the people that make up these organizations must be applauded for the efforts they make to encourage agricultural development and the diffusion of innovations in their country. Tunisia has been pulled out of the poverty trap and continues the trend upward in increasing the quality of life of its people. The researcher was impressed by the passion of the people working in agriculture and the pride they took in their country and their work. Agricultural institutions strived to meet the needs of farmers and other agriculturalists on individual as well as national levels. They struggled to continue to improve the system and services offered to farmers, and they should capitalize on the strengths and opportunities of the system. The recommendations at the end of this chapter that are directed to those outside of Tunisia may be able to use the Tunisian agricultural system as an example for designing and planning agricultural systems in other countries facing similar circumstances.

Extension as a discipline was built upon the foundation of meeting an audience's needs through educational methods. In order for the extension process to be effective, the process must start from the bottom up. Farmer needs must be considered so that researchers know what direction to take in their agendas, extension agents know which educational programs to offer, and the national government can make efforts to support

agriculture. Institutions sincerely attempt to meet the needs of farmers, but a more participatory and truly decentralized system is needed.

Also, an organization must have an attitude of encouraging people to admit and overcome weaknesses so that the unit will become stronger as a whole. If problems are ignored, they will never be fixed; they will only grow until they break through that outer shell to become a big, obvious problem. For example, Tunisian agricultural institutions tended to breed homophilous relationships, thus preventing an effective spread of new information. These organizations did not appear to understand the importance of weak ties or heterophilous relationships in diffusing the best information to farmers.

If an organization hangs on too tightly to its own power, it will never be able to let go of any of its responsibilities. The power structure for Tunisian agricultural institutions was too narrow. The administration held most of the power, and those lower along the power chain had little authority to make even some of the most basic decisions. Thus, decentralization of power, efforts, and authority was needed. These conclusions, as well as findings concerning weaknesses in the communication system, show that certain aspects of the organizational design were detrimental to the government as well as the farmers.

Tunisian agriculturalists face many challenges; as agricultural institutions strive to meet needs of the agricultural sector, they face some of the same challenges. Potential obstacles come from outside as well as within. If leaders in agriculture are aware of these weaknesses and threats, they can be better prepared to find solutions and alternative directions. *True* decentralization was needed, down to the local opinion



leaders who would be able to influence local farmers to accept or reject innovations or even affect local cooperation with the government.

The following recommendations are aimed at helping Tunisian agricultural institutions improve their efficiency and effectiveness on an organizational level.

### **Recommendations for Tunisian Agricultural Institutions**

The following recommendations are designed to help further the development of agriculture in Tunisia. The researcher suggests the following statements based on her findings in the study and from conversations with the various respondents.

1. An attitude of independence of farmers should be encouraged at all levels. The government could begin to let UTAP and independent farmer organizations develop their own programs to meet farmer needs.
2. Efforts to improve communication on the national level should focus on national organizations that share similar goals. For example, agricultural teaching, research, and extension organizations share an ultimate goal of improving agriculture on a national level as well as for individuals. Heterophilous relationships should be encouraged so that communication can be spread through as many organizations as possible. Therefore, AVFA should be placed under the leadership of IRESA so that research, teaching, and extension can be fully united.
3. Create a specialization at INAT for teaching and extension to prepare the next generation for the challenges that agriculturalists will face in the future.

Technical information is good, but if no one is trained how to disseminate that

information (on individual and national levels), then all the technical information will be wasted. Students could have a secondary specialization in order to gain experience in a hard science area, but their main focus would be agricultural education. The social science of agriculture is just as important, as hard sciences.

4. As Tunisian communication networks improve (i.e. phone lines and access to Internet), employees should be encouraged to communicate via email on a consistent basis. A formal plan for communication should be created so that information is quickly disseminated between institutions.
5. Agricultural organizations should be encouraged to develop clear and definite mission statements so that all employees and clientele will know the purpose of the organization and where that organization is headed.

### **Recommendations for Further Study**

The researcher hopes that this study will be useful in providing a multi-dimensional look into the Tunisian agricultural system and institutions. Organizational leaders will hopefully make use of the recommendations ensuing from the findings in this study. Further studies are suggested to augment this original research, specifically in the area of agricultural education in Tunisia. A needs assessment from the perspective of agricultural education would be helpful to determine how an agricultural education program might be started (ex: methodology, diffusion of innovations, leadership). A similar study to this one might be conducted in 3-5 years to compare the progress of agricultural institutions in their effectiveness.

In addition, the researcher suggests that a useful study might be to research the agriculture system in Tunisia as it relates to youth development. The study could determine how youth learn about agriculture and develop those skills associated with the science and leadership aspects of agriculture.

Another useful study would be to research similar information entirely from the perspective of clientele to more closely determine their needs. The author hopes that this study will encourage the relationship between Tunisian agricultural institutions and related organizations in the United States as well as help Tunisian leaders in agriculture continue to improve the quality of life for their clientele.

## REFERENCES

- Bairstow, R., Berry, H., & Driscoll, D. M. (2002). Tips for teaching non-traditional audiences. *Journal of Extension*, 40(6). Retrieved March 28, 2002, from <http://www.joe.org/joe/2002december/tt1.shtml>.
- Beltran, L. R. (1974). Rural development and social communication: Relationships and strategies. *Communication Strategies for Rural Development: Proceedings of the Cornell-CIAT 1974 International Symposium*. Cali, Colombia. Obtained from the U.S. Agency for International Development, Washington, D.C.
- Borlaug, N. E. (1995). Strengthening national extension services in sub-Saharan Africa: Summary discussion. *Strengthening National Extension Services in Sub-Saharan Africa: Proceedings of a Seminar for Extension Practitioners*. Chavannes-de-Bogis, Switzerland. 89-93.
- Browne, S. (1999). *Beyond aid: From patronage to partnership*. Burlington, VT: Ashgate.
- Clement, C. (2001, November). *Draft trip report for travel to Tunisia*. Unpublished Document. Office of International Agriculture, Texas A&M University, College Station.
- Cook, L. (2000, September). Assessing export platforms: The case of Tunisia. *Consulting Assistance on Economics Reform II*. CAER II Discussion Paper No 74. Harvard Institute for International Development, Cambridge, MA.
- Erlandson, D. A., Harris, E. L., Allen, S. D., & Skipper, B. L. (1993). *Doing naturalistic inquiry: A guide to methods*. Newbury Park, CA: Sage Publications, Inc.
- Foster, R. H., & McBeth, M. H. (1996). Urban-rural influences in US environmental and economic development policy. *Journal of Rural Studies*, 12, 387-397.
- Friedman, T. L. (2000). *The Lexus and the olive tree*. New York: Anchor Books.
- Lincoln, Y. & Guba, E. (1985). *Naturalistic inquiry*. Thousand Oaks, CA: Sage Publications, Inc.
- Lupien, J. R. (2002). Hunger after the millennium: Perspectives and demands. *Nutrition Today*, 37(3), 96-102.

- MacCracken, J. (1977, October). Response to Illich's 'Revolting development.'  
*Dun & Bradstreet Reports Magazine*, 25(5), 18.
- Morrison, C. & Talbi, B. (1996). *Long-term growth in Tunisia*. Country Study #56.  
Organisation for Economic Co-operation and Development. Paris.
- Mwangi, J. G. (1998). The role of extension in the transfer and adoption of agricultural technologies. *Journal of International Agriculture and Extension Education*, 5(1). Retrieved March 28, 2003, from <http://ag.arizona.edu/aiaee/journals/Vol-5.1.pdf>.
- Ntifo-Siaw, E. & Agunga, R. A. (1994). A comparative study of management effectiveness under the training and visit and general extension systems in Ghana. *Journal of Agricultural Education*, 35(4), 36-41.
- Percy, R. (2000). Capacity building for gender-sensitive agricultural planning in Ethiopia. *Journal of Agricultural Education and Extension*, 7(1). Retrieved January 29, 2003 from <http://www.bib.wau.nl/ejae/jaeev07n01p04.pdf>.
- Rivera, W. M. (2000, July). The changing nature of agricultural information and the conflictive global developments shaping extension. *Journal of Agricultural Education and Extension*, 7(1). Retrieved November 18, 2003, from <http://www.bib.wau.nl/ejae/jaeev07n01p05.pdf>.
- Rogers, E. M. (2003). *Diffusion of innovations* (5<sup>th</sup> ed.). New York: The Free Press.
- Rondinelli, D. A. (1977). *Planning development projects*. Stroudsburg, PA.: Dowden, Hutchinson, and Ross.
- Smith, F. J. (2000, February 12). *Analysis and design of systems for monitoring and evaluation of research and extension services and impacts*. Report prepared for the U.S. Agency for International Development, Washington, D.C.
- Tunisia: Country profile. (2003, March 3). Retrieved April 29, 2003 from [https://tripprep.com/destina/destina\\_summaries/showcontent.asp?DocID=185\\_full](https://tripprep.com/destina/destina_summaries/showcontent.asp?DocID=185_full).
- Valente, T. W. (1999). *Network models of the diffusion of innovations*. Cresskill, NJ: Hampton Press, Inc.
- Van Crowder, L. (1996, September). *Decentralized extension: Effects and opportunities*. Retrieved December 11, 2003 from <http://www.fao.org/sd/EXdirect/EXan0013.htm>.

- van den Ban, A. W., & Hawkins, H. S. (1996). *Agricultural extension*. Cambridge: Blackwell Science.
- Wolf, C. (2002). *Straddling economics and politics: Cross-cutting issues in Asia, the United States, and the global economy*. Arlington, VA: RAND.
- World Link (2000). Fruity issues. Retrieved Jan 31, 2003 from <http://search.epnet.com/direct.asp?an=3806670&db=aph>.
- Zakaria, F. (2003). *The future of freedom*. New York: W.W. Norton and Company.
- Zinnah, M. M. (1994). Linking research, extension and farmers: The case of mangrove swamp rice cultivation in Sierra Leone. *Journal of Agricultural Education* 35(2), 50-54.

**APPENDIX A**  
**INTERVIEW QUESTIONS DIRECTED TO EMPLOYEES OF**  
**AGRICULTURAL INSTITUTIONS**

*Education, Research, and Extension: An Evaluation of Agricultural Institutions in Tunisia*

Interview Questions for employees of Tunisian agricultural institutions

1. How long have you been in this position?
2. What main projects are you working on now?
3. How do you receive information about new technology and innovations?
4. Which three colleagues do you go to for discussion?
5. Which three colleagues do you go to for friendship?
6. Which three colleagues do you go to for advice?
7. Which three people outside your organization do you talk within order to learn about new technology and innovations?
8. How is the information your agency receives transferred to the farmers?
9. What is a recent innovation your agency has dealt with?
10. How did you find out about it?
11. How long did it take for the first of your clientele to adopt the innovation?
12. What challenges does your agency face in communicating new technology to clientele?
13. How many employees does your organization have?
14. Where are they located?
15. How is authority delegated within your agency?
16. Is there anyone else who would be good to interview?



**APPENDIX B**  
**INTERVIEW QUESTIONS DIRECTED TO CLIENTELE OF AGRICULTURAL**  
**INSTITUTIONS**

*Education, Research, and Extension: An Evaluation of Agricultural Institutions in  
Tunisia*

Interview questions for clientele of Tunisian agricultural institutions

1. What agricultural sector are you involved in?
2. How much of your product do you produce/sell? (not for students)
3. How long have you had this job/interest?
4. What is your relationship with government agencies like?
5. What is the last new agricultural technology that you heard about?
  - a. How did you hear about it?
  - b. Did you start using it?
  - c. Why or why not?
6. When you hear about something new, whose opinion do you trust?
7. Who are three people you go to for advice?
8. Who else could I talk to about these questions?

**APPENDIX C**  
**INFORMATION SHEET GIVEN TO RESPONDENTS**  
**ENGLISH AND FRENCH**

### **Information Sheet**

The research subject understands that he or she is participating in a research study with Shannon Hajdik for partial completion of the degree of Masters of Science. This study explores how agricultural information is communicated in Tunisia. Approximately 20 subjects will be interviewed in person beginning 05-20-03 and ending 06-30-03. Interviews may take up to one hour and will take place in a mutually agreed upon location.

No risks are perceived to occur from participation in this study, nor are there benefits or compensation available. Any questions asked during the interview period that makes the subject feel uncomfortable may be refused. Participation in this study is completely voluntary, and the subject may withdraw at any time without penalty in any way.

The research subject's answers will remain confidential and only the researcher will have access to notes from the interview. All interview answers will be coded, and only the researcher will have access to the master list where the subject's name will be kept on a list that corresponds to the subject's code. The interview will be tape recorded for the researcher's use in transcribing the interview. However, the subject may refuse to be audiotapes without affecting his or her participation in the study. The tapes will be destroyed after 3 years.

This research study has been reviewed and approved by the Institutional Review Board-Human Subjects in Research, Texas A&M University, United States of America. For research related problems or questions regarding subjects' right, the Institutional Review Board can be contacted through Dr. Michael W. Buckley, Director of Support Services, Office of Vice President for Research at (979) 458-4067.

By answering the interview questions, the subject agrees to participate in this study

Questions regarding this study can be addressed to:  
Shannon Hajdik  
2116 TAMU, College Station, TX, 77843-2116, USA  
(979) 845-7202 or shajdik@tamu.edu

or

Dr. Kim Dooley  
2116 TAMU, College Station, TX, 77843-2116, USA  
(979) 862-7180 or k-dooley@tamu.edu.

### **Fiche d'information**

Le sujet de la recherche est avisée qu'il ou elle participe a une étude avec Shannon Hajdik, qui a pour objectif de compléter partiellement son diplôme en science (maîtrise en science). Le but de l'étude est de déterminer de quelle manière communique t'on les informations agricoles en Tunisie. Environ 20 sujets seront interviewés en personne a partir du 20/05/2003 jusqu'au 30/06/2003. Les entretiens dureront à peu près une heure et auront lieu dans un endroit que nous aurons mutuellement convenu.

La participation a cette étude n'entraînera aucun risque. Il n'y aura aucun avantage et également aucune compensation disponible. Si le sujet se sent mal a l'aise vis-à-vis des questions, il est en droit de refuser d'y répondre. La participation a cette étude est bénévole, et le sujet peut abandonner à tout moment sans aucune pénalité.

Les réponses des personnes interviewées resteront confidentielles. Seul le chercheur aura accès aux réponses des entretiens. Toutes les réponses des entretiens seront codées, et seul le chercheur aura accès aux listes. Le nom du sujet sera maintenu sur la liste qui correspond au code du sujet. Les entretiens seront enregistrés pour permettre au chercheur de transcrire les entretiens. Cependant, le sujet a le droit de refuser d'être enregistré. Et ce refus n'affectera pas sa participation a l'étude. La bande enregistrée sera détruite après 3 ans.

L'étude de recherche a été lue et approuvée par le « Institutional Review Board-Human Subjects in Research », Texas A&M, USA. Pour toutes questions relatives à la recherche concernant les droits des personnes interviewées, vous pouvez contacter le « Institutional Review Board » par l'intermédiaire du Dr Michael W. Buckley, directeur des services des supports, bureau du vice-président pour la Recherche, au numéro de téléphone suivant : (979) 458-4067.

En répondant aux questions de l'entretien, le sujet accepte de participer à l'étude.

Les questions concernant les entretiens peuvent être posées à :  
2116 TAMU, College Station, TX, 77843-2116, USA  
(979) 845-7202 or shajdik@tamu.edu

ou

Dr. Kim Dooley  
2116 TAMU, College Station, TX, 77843-2116, USA  
(979) 862-7180 or k-dooley@tamu.edu

**APPENDIX D**  
**PEER DEBRIEFING**

## **Peer Debriefing Meetings**

### *Education, Research, and Extension: An Evaluation of Agricultural Institutions in Tunisia*

The researcher spent six weeks in Tunisia in order to complete the necessary interviews for the study. She analyzed the data as the study progressed, and she compared her progress to the thoughts of a couple of professors familiar to the study. As prescribed in qualitative research processes and emergent design, the researcher allowed the study to develop as her findings suggested. Once the study was complete, her proposal to the Association of International Agriculture and Extension Education for the 2004 conference in Dublin, Ireland was accepted. This paper was based on the strengths, weaknesses, opportunities and threats that affect the diffusion of innovations through Tunisia agricultural institutions.

The two peer debriefing sessions the researcher held helped the author to ensure that her findings were on track. She met with Dr. M'Naouer Djamelli, professor of animal science at INAT (PR-1), while still in Tunisia and then with Dr. Kim Dooley, professor of agricultural education at Texas A&M, once she returned to Texas. The following notes are from those meetings the author had with each peer reviewer.

#### *Meeting with Dr. M'Naouer Djamelli*

The researcher held a meeting with Dr. Djamelli on June 11, 2003 in his office on the INAT campus in Tunis. The primary objective of the meeting was to ensure that the researcher's findings were moving in the right direction.

Dr. Djamelli agreed that the researcher's study was moving in the right direction and that her findings were aligned with trends in the agricultural system. He confirmed that the national policy was said to be that extension was leaning toward privatization and that the administration was pulling back, but really the administration was just in a different form. Privatization was not really happening. Government employees were lasidasical in their jobs, and change was not fast. UTAP was also simply a political union instead of the commodity-oriented organization they aspired to be.

Dr. Djamelli did agree that Tunisia's strength was its structure since independence. It was a complicated system, but it worked. Agricultural institutions looked not only from an economic point of view, but a social point of view as well. The government encouraged farmers to keep farming, especially the small ones. Farmers had many incentives from the government, such as not paying some taxes.

He emphasized his belief that the farmers could indeed help themselves and that farmer-led organization were necessary for further development. These farmers and those who have vision for agricultural development should not be hindered. The system should not remain static.

Tunisia inherited the French system. Franch got rid of it, but Tunisia still used this old system. Tunisia was still a young country. After independence, nationals had to be trained to do many of the jobs the French has always done. Teaching, research, and extension were split. IRESA brought teaching and research together, but extension was still separate.



*Meeting with Dr. Kim Dooley*

The researcher met with Dr. Dooley in her office at Texas A&M on July 8, 2003 in order to hold a peer debriefing session where the researcher could confirm her methodology and the emerging themes from the study.

The researcher reviewed her findings with Dr. Dooley and discussed her initial reactions and how the information might be organized. Dr. Dooley suggested that in order to meet the objectives of the study, the findings could be organized into a SWOT (strengths, weaknesses, opportunities, and threats) analysis. The researcher and Dr. Dooley reviewed the findings together to discover that all the findings could fit into one of these categories. Dr. Dooley helped the researcher to place some of the findings she was not sure about. For example, farmer needs could be a strength or an opportunity, and it was determined that they could be discussed in both sections. It was also suggested that the researcher amend the research questions to help organize the findings.

Qualitative methods were also discussed. Dr. Dooley showed the researcher how to document an audit trail and other means of establishing the trustworthiness of the study. Dr. Dooley also encouraged the researcher to submit a proposal for the 2004 AIAEE conference in Dublin, Ireland.

**APPENDIX E**  
**AUDIT TRAIL**

**Audit Trail**  
(In Order of Appearance in Research Findings)

<b>Interviewee</b>	<b>Page number</b>	<b>Description</b>
EI-7	p. 38	AVFA employee who interviewed on May 23, 2003 in Sidi Thabet
RI-3	p. 38	Researcher who interviewed on August 29, 2003 in Texas
EI-1	p. 39	AVFA employee who interviewed On May 20, 2003 in Tunis
RI-2	p. 40	Researcher who interviewed on June 9, 2003 in Tunis
AI-1	p. 40	APIA employee who interviewed on May 28, 2003 in Tunis
AI-2	p. 40	APIA employee who interviewed on May 28, 2003 in Tunis
GI-4	p. 41	<i>Groupement</i> employee who interviewed on June 7, 2003 in Tunis
CI-3	p. 41	Center employee who interviewed on June 4, 2003 in Bousalem
CI-4	p. 41	Center employee who interviewed on May 29, 2003 in Sidi Thabet
PI-1	p. 42	Professional organization representative who interviewed on May 24, 2003 in Nabeul
TI-4	p. 44	INAT professor who interviewed on June 21, 2003 in Tunis
EI-2	p. 44	AVFA employee who interviewed on May 21, 2003 in Tunis
EI-5	p. 44	AVFA employee who interviewed on May 22, 2003 in Tunis

EI-6	p. 44	AVFA employee who interviewed on May 22, 2003 in Tunis
EI-3	p. 44	AVFA employee who interviewed on May 21, 2003 in Tunis
PI-2	p. 45	Professional organization representative who interviewed on May 26, 2003 in Tunis
O-1	p. 46	Observation made and journaled on June 3, 2003 outside of Tunis
CI-1	p. 46	Center employee who interviewed on June 2, 2003 in Tunis
TI-1	p. 46	INAT professor who interviewed on June 18, 2003 in Tunis
O-2	p. 47	Observation made and journaled on May 24, 2003 in Kelibia
O-3	p. 48	Observation made and journaled on May 30, 2003 in Tunis
O-4	p. 48	Observation made and journaled on June 21, 2003 in Tunis
TI-3	p. 48	INAT professor who interviewed on June 23, 2003 in Tunis
EI-9	p. 49	AVFA employee who interviewed on May 24, 2003 in Korba
TrI-1	p. 50	Training employee who interviewed on May 24, 2003 in Kelibia
EI-8	p. 49	AVFA employee who interviewed on May 24, 2003 Nabeul
RI-1	p. 51	Researcher interviewed on May 28, 2003 in Tunis

FI-2	p. 51	Farmer interviewed on May 31, 2003 in Tunis
GI-1	p. 51	<i>Groupement</i> employee interviewed on June 5, 2003 in Tunis
O-5	p. 52	Observation made and journaled on June 3, 2003 outside of Tunis
GI-2	p. 52	<i>Groupement</i> employee interviewed on June 7, 2003 in Tunis
GI-3	p. 52	<i>Groupement</i> employee interviewed on June 7, 2003 in Tunis
GI-5	p. 53	<i>Groupement</i> employee interviewed on June 7, 2003 in Tunis
O-6	p. 54	Observation made and journaled on May 26, 2003 in Tunis
O-7	p. 54	Observation made and journaled on June 13, 2003 in Tunis
O-8	p. 55	Observation made and journaled on May 30, 2003 in Tunis
FI-1	p. 56	Farmer interviewed on May 30, 2003 in Tunis
FI-3	p. 57	Farmer interviewed on June 21, 2003 in Tunis
O-9	p. 61	Observation made and journaled on June 9, 2003 in Tunis
O-10	p. 61	Observation made and journaled on May 22, 2003 in Tunis

## VITA

### Shannon Hajdik Bedo

1808 Huisache  
Richmond, TX 77469  
(281) 450-1856  
shbedo@yahoo.com

---

#### EDUCATION

Master of Science in agricultural education,  
Texas A&M University, 2004

Bachelor of Science in agricultural development  
Texas A&M University, 2002

#### RELATED WORK, VOLUNTEER, AND ACADEMIC EXPERIENCE

Extension Assistant, Texas Cooperative Extension  
1999-2004

Texas A&M University & *Institute National Agronomique  
de Tunisie* student exchange program  
May – June 2003

International Conference for Agricultural Science &  
Technology  
October 2003

Study Abroad in Vietnam  
December 2001 – January 2002

#### PUBLISHED PAPERS

*What's Really Going On: Collaboration of Research  
Efforts Within a Department of Agricultural Education  
Department.* Proceedings from the Western Region  
Association of Agricultural Education Conference in  
Portland, Oregon, 2003.

#### PROFESSIONAL ORGANIZATIONS

Texas Cooperative Extension Specialists Association  
2002-2004

Texas A&M Agricultural Education Graduate Student  
Association  
2002-2003