Promoting Tunisian agri-food start-up.
A study on the self-efficacy
of aspiring entrepreneurs

Filippo Fiume Fagioli*, Elena Viganò*

Abstract

In 2011, Tunisia went through a revolution which transformed its modern history. Currently, the country is experiencing a moment of transition in which it faces problems, both on a social and economic level. The region Kroumerie-Mogods, in the northwest, includes the three Governorates of Jendouba, Beja and Bizerte, is strongly affected by past economic policies. Despite having great potential in terms of both natural resources and economic opportunities, the local population appears to be among the poorest in the country, suffering from high level of unemployment, widespread poverty and substantial inequalities. In this context, a Development Cooperation project was implemented with the aim of creating new employment opportunities, especially for young people and women, through the enhancement of the territory and its agricultural products with the support of new entrepreneurial initiatives. Principal Component Analysis and Logit model were used to analyse the Self-Efficacy (SE) of young aspiring entrepreneurs and to evaluate its effects on the promotion of personal entrepreneurial projects. The study shows that past involvement in business key activities, as commercial experiences, social commitments and sustainable waste management, represent a decisive element for the promotion of personal business projects in agri-food sector.

Keywords: Tunisia, Start-up, Development cooperation, Agri-food, Sustainable development, Self-efficacy.

1. Introduction

The path for a sustainable development represents a real challenge for the countries of the Mediterranean area, particularly exposed to the effects of climate change and, at the same time, characterized by strong social and territorial inequalities. The ability of the African continent to tackle many of the serious challenges it faces, depends strongly on its capacity to promote new kinds of entrepreneurs, adopt new technologies, and build institutions to manage those changes (Ben Youssef *et al.,* 2018).

These issues are even more relevant in Tunisia which in 2011 experienced a revolution that transformed its modern history. Ten years later, the country is facing a complex transition which closely involves the Tunisian population, afflicted by a high degree of unemployment, a low level of education, and a difficult social situation caused by a serious economic crisis.

Most of the jobs created by the economy are in low-value added activities and mostly in the informal sector, offering low wages and no job security, and such conditions do not meet

* Department of Economics, Society, Politics, University of Urbino "Carlo Bo", Urbino (PU), Italy.
Corresponding author: filippo.fagioli@uniurb.it

the aspirations of the highly educated population (World Bank, 2014). Currently, the global unemployment rate in the country stands at 15.1% with a strong gender gap. Female unemployment is 22% while male unemployment is 12.3%. These percentages rise respectively to 38.1% (female) and 15.7% (male) if higher education graduates are considered (INS, 2020). High emigration historically relieved some of the labour market pressures in the country but the global crisis has made access to foreign job markets more difficult, further increasing internal social tensions as well as accentuating persistent gender discrimination (IILS, 2011)

Thus fighting unemployment and reducing inequalities between different regions are crucial for the development of a country like Tunisia where agriculture plays a strategic role in the management of territorial and environmental balances contributing to 13.3% of GDP, and about a third of the population living in rural areas (World Bank, 2018).

The complex economic situation is also reflected in the country's entrepreneurship branch, which is becoming increasingly poor. According to Antonelli *et al.* (2020) the country ranks lower in terms of global entrepreneurship compared to its regional neighbours such as Egypt, Jordan, but also compared to United Arab Emirates, and Saudi Arabia, scoring in 2019, the loss of 13 positions in the Global Entrepreneurship Index (Acs *et al.*, 2020).

The aim of this work is to present the results of the analysis carried out on the Self-Efficacy (SE) of young aspiring entrepreneurs.

This paper is structured as follows. Section 2 presents a literature review on selected keywords, followed by an analytical description of the region in which the development project has been implemented and its lines of action. Section 3 describes the questionnaire used to collect data and methods applied for the study of the SE and its effects on the development of entrepreneurial projects, including Principal Component Analysis (PCA) and Logit model (Section 3.4). Section 4 presents a discussion about results followed by conclusions in Section 5.

2. Background

In 1977 Albert Bandura introduced his Self-Efficacy theory, in which he proposed that self-efficacy and outcome expectancies are key to behaviour initiation and maintenance. The fundamental characteristic of this theory is its multidimensionality, which has allowed its application in many scientific fields, starting from the psychological ones, with the studies on motivation (McCarthy *et al.*, 1985; Schunk, 2003) and healthcare (Wong *et al.*, 2005), including those on performance outcomes (Pajares and Johnson, 1994).

The Self-Efficacy construct is able to explain various cognitive and motivational aspects, including the impact of positive experiences and successes, perseverance in commitment, optimism and the development of interests in specific cultural and professional areas. While there is broad consensus among researchers on the importance SE in entrepreneurial motivation, intentions, and behavior, few studies however deal with Self-Efficacy in rural contexts like North Africa and especially in Tunisia, where entrepreneurship is considered one of the keys to sustainable development.

In order to conduct a rigorous literature review, six keywords related to the topic were identified and a search was carried out on the Scopus database, which allowed researchers to consult papers, books, abstracts and articles from both academic and professional publishers. Four subject areas have also been chosen: (i) Business, Management and Accounting; (ii) Economics, Econometrics and Finance; (iii) Environmental Science; (iv) Agricultural and Biological Sciences. The final list of keyword combinations used and the number of articles found is shown in Table 1.

The literature review shows some important evidence. It is interesting how there are no papers related to the agri-food sector in combination with the Self-Efficacy keyword as well as with the keyword Development Cooperation.

Only five papers deal with SE in Tunisia, but none of them concern start-up or young entrepreneurs. For example, Guo *et al.* (2013) have studied the common values of consum-

Table 1 - Keywords interaction table – Performed using Scopus September 2020.

Keywords	Tunisia	Start-up	Development Cooperation	Agri-food	Sustainable Development	Self-Efficacy
Tunisia	-					
Start-up	11	-				
Development Cooperation	4	0	-			
Agri-food	9	9	0	-		
Sustainable Development	122	166	70	215	-	
Self-Efficacy	5	54	0	0	68	-

ers in terms of financial needs, while Nasri and Charfeddine (2012) have examined several factors that affect the adoption of Internet banking by Tunisian bank customers. Mosbeh and Soliman (2008) and Khelil *et al.* (2018) are more oriented towards large company analysis, using self-efficacy to investigates the effect to the support and independence of internal auditor and to identify factors that are perceived to affect the decision to adopt corporate intranet in a developing country.

The topic of start-ups in Tunisia is addressed by several authors. Arouri *et al.* (2016) have analysed the impact of small firms' entry and exit dynamics on net job creation, pointing out how small firms in Tunisia have a strong social impact on job creation, but a weak economic impact in terms of wealth creation. In this context, small firms' entry rates in the job market are driven mostly by necessity entrepreneurs, while the skilled workforce, which currently is largely unemployed, does not contribute to this process through the creation of innovative start-ups.

Khefacha *et al.* (2012) developed an econometric model of entrepreneurship which allow for the identification of factors influencing transitions into self-employment at the regional level in the country. In this case the authors have shown that the direct knowledge of people who have started their own business and the presence of good opportunities to create business, positively stimulate the creation of new start-ups.

The literature concerning the study of SE in the broader context of Start-ups is quite varied and develops in the so-called Entrepreneurial Self efficacy (ESE). In this context, SE involves individuals' beliefs regarding their capabilities for attaining success and controlling cognitions for successfully achieving challenging goals during the business start-up developing process (Drnovšek *et al.*, 2010).

From the Sustainable Development (SD) point of view, Sher *et al.* (2020) argue that the promotion of sustainable ventures and behaviours among aspiring entrepreneurs could lead to an effective solution to reduce ecological footprints and help achieve the Sustainable Development Goals (SDGs). An SE study on the drivers of sustainable start-up among university students, point out how the attitude towards sustainable entrepreneurship is a complement of sustainability-driven entrepreneurial intentions. In addition, St-Jean and Labelle (2018) use SE to study the effect of entrepreneur sustainable orientation and motivation on entrepreneurial behaviour.

This literature review allowed us to clarify two crucial points of this work. First of all, SE is a valid analysis tool in the study of the behaviour of aspiring entrepreneurs. In addition, there is a lack of literature on the use of this method for the analysis of start-ups in the agro-food sector, and especially in Tunisia.

3. The territorial context

The past centralized approach and a strong regional inequality have caused a large gap between the development of coastal areas and the rest of the country, demonstrated by a poverty rate of inland areas that has now reached alarming levels (African Development Bank, 2020).

The north western region of the country, called Kroumerie-Mogods, the main humid area of Tunisia, leading to the development

Table 2 - Socio-economic indicators of Beja, Bizerte, Jendouba Governorates. Tunisia Regional Data (INS, 2015).

Index (%) /Governorates	Beja	Bizerte	Jendouba
Total population*	303.032	568.219	404.203
Population in rural areas	55,7	34,7	68,8
Employees in the agricultural sector	11,7	4,5	10,8
Total unemployment rate	18,0	12,9	26,0
Unemployment rate (15-29 years)	13,7	11,9	20,1
Female unemployment rate	29,0	20,6	38,7
Total illiteracy rate	29,4	20,0	32,1
Illiteracy rate (15-29 years)	22,0	14,8	22,4
Female illiteracy rate	37,0	26,0	41,2

* total unit.

of a dense forest (Zielhofer and Faust, 2008). The area, consisting in three Governorates of Beja, Bizerte and Jendouba, is characterized by a strong delay in terms of development, with high rates of unemployment and illiteracy (see Table 2).

Past policies had a strong effect on the regional economy, with a clear advantage for the service sector, especially tourism, over the primary sector. After the collapse of tourist presences, in recent years, the Regions suffered a very disadvantageous economic situation, relying almost exclusively on the agro-pastoral economy. The businesses, generally small and family-run, practice subsistence agriculture, which includes the cultivation of wheat and crops for livestock, but also the production of fruit and vegetables, legumes, cheese and honey. Although the forests extend for more than 483,000 hectares, their exploitation is rather limited and includes the craftsmanship of wood, the distillation of plant essences (rosemary, myrtle, mint) and the collection of mushrooms.

Those who work in agriculture and in the connected sectors have limited training, with scarce skills, both in terms of the management of production and in terms of relations with the market and distribution networks. In addition, the absence of a vertical integration along the supply chain and the poor efficiency of regional institutions and logistic systems logistic makes it very difficult for the economy of the region to develop.

4. Development Cooperation actions

Improving the quality of life of the most disadvantaged communities is one of the most ambitious objectives of the international strategy for SD. Addressing this issue in the countries bordering the Mediterranean sea, means strengthening and making the fight against poverty more effective, contributing to the reduction of inequalities, ensuring an adequate level of training and decreasing the exposure of the most vulnerable classes to economic, social and environmental shocks.

In the rural context characteristic of North African countries, agriculture plays a strategic role in achieving these objectives, which require a growing commitment to collaboration, cooperation and integration between different political and economic systems.

Lin and Si (2014) pointed out that the government can enhance the entrepreneurial intention of rural individuals by updating entrepreneurial policies, by training and education in entrepreneurial activities that target the rural masses, and by promoting a successful entrepreneurial mode.

The "Start-Up Tunisie" Project, co-founded by Italian Agency for Development Cooperation (AICS) and composed of a broad partnership of public bodies and agri-food business, aims to create new job opportunities for young people and women, supporting the establishment of new start-ups in the fields of agriculture, livestock and agri-food products processing, with a focus on organic supply-chain development,

building better trading conditions and promoting sustainability through the creation of collaborative networks (Mariani and Viganò, 2013).

Tunisia is the African country with the largest organic cultivation area, following the implementation of organic regulations, in the broader context of the national strategy to reform agriculture (Willer and Lernoud, 2019), but main productions are located in other regions than Kroumerie-Mogods. On the other hand, it is necessary to consider that organic products are booming in Tunisia, as well as dietetics and fair trade (Kamoun *et al.*, 2015; Callieris *et al.*, 2016). This constitutes a good premise for the reorganization of production and distribution activities, to promote a better management of common goods (Sturla *et al.*, 2019), and to create relationship that increase the "connectedness" of several stakeholders (public institutions, consumers) to food production, by different types of local supply chain (Seyfang, 2007; Goodman *et al.*, 2012; Blasi *et al.*, 2016).

Across the world the creation of micro, small and medium enterprises (MSMEs) are seen as a way of driving economic development and transformative growth, and for some, a route out of absolute and relative poverty (Holt, 2020). Apostolopoulos *et al.* (2018) highlight the role of entrepreneurship as a transformational driver offering the scaffolding for both attaining and delivering the SDGs, and fuelling economic growth led by the principle of SD.

After a first mapping of the agri-business in the Region aimed at defining their dimensional profile, the type of production activated and the relations between producers and markets, the project has undertaken various lines of action.

Some companies have been selected to benefit by interventions to improve production and economic efficiency. In particular, financial support has been provided for the acquisition of specific equipment or for the purchase or improvement of production facilities, but also for training and assistance on production techniques. Next to this line of action, the Project design includes the activation of literacy courses and vocational training to reduce the level of illiteracy and improve the skills of young people and women, who could be included as employees and consultants of the selected companies.

The training activity was preparatory to the formulation of project proposals, in the form of the Business Plan (BP), by the participants, among which the most appropriate were selected for receiving the necessary funding to start production activities. Participants had the option to choose whether to submit the business plan for evaluation or not and thus, to be excluded from the programme.

In this context, each participant was given a questionnaire containing questions relating to different aspects of their business idea and certain questions were aimed at analysing the motivation of the individual participants for starting their own business. This study is the result of the analysis of their responses.

5. Materials and methods

From the development cooperation point of view, Pajardi *et al.* (2020) point out the role of SE in the context of international projects and its importance in determining the attitude of people towards promoting change and improving their living conditions by themselves.

In social psychology theory, SE refers to an individual's self-belief that they can successfully accomplish a certain task and overcome the challenges associated with it (Bandura, 1977, 1997). SE has been recognized as one of the main aspects which can affect psychological empowerment (Zimmerman, 2000) aspirations, motivation and achievements (Bandura, 1993). It can be manifested through various elements of personal behaviour, such as how well a person perseveres in the face of adversity or their will to engage in behaviours or tasks that may be perceived as challenging (Roy *et al.*, 2018).

The current study is based on a model similar to Hedonic Contingency Theory (HTC) (Wegener and Petty, 1994). With this approach, we assume that individuals in a positive mood try to maintain this mood by engaging in a task where they feel efficacious. Therefore, these individuals will be strongly motivated to perform such a task and achieve better results.

In our case study, we expect that there is a positive relationship between the Self-Efficacy of the subjects who participated in the pro-

Table 3 - Items, variables explanation and sentences for Self-Efficacy measurement.

Fields (aggregated variables)	Variable	Item	Sentences
Economic (EC)	Ec1	Commercial	I am able to use the skills I have acquired in the commercial field to face the challenges that arise building my start-up
	Ec2	Self-consumption	I had experiences of self-consumption that will be useful in the development of my business
	Ec3	Local material and buildings	Skills in using local materials, including building construction, are very useful for the development of my start-up
Social (SO)	So1	Social	My commitments in the social sphere have allowed me to have the sensitivity necessary to develop my idea while respecting others
	So2	Cultural	My traditions will be useful to me to develop my business idea
	So3	Awareness of the local population	The skills acquired in raising awareness of the environmental issues of local populations are very useful for the development of my start-up
Environmental (EN)	En1	Waste Management	Waste management skills acquired are very useful for the development of my start-up
	En2	Water waste	The skills acquired to avoid water waste are very useful for the development of my start-up
	En3	Wastewater collection	The skills acquired in wastewater collection are very useful for the development of my start-up
	En4	Renewable energy	The skills acquired in the field of renewable energy are very useful for the development of my start-up
	En5	Sustainable exploitation of protected areas	The skills acquired in the sustainable exploitation of protected areas are very useful to me for the development of my business

ject, and their decision to create and submit the BP for evaluation and possible admission to the financing.

In this context, SE is considered as the belief of individuals that they can use their past experiences and cognitive resources to face the challenges that the implementation of their entrepreneurial projects puts before them.

Entrepreneurship is the result of the interaction between entrepreneurs' attributes and the surrounding environment (Capelleras *et al.*, 2013; Wennberg *et al.*, 2013). According to Malebana and Swanepoel (2014), who highlight the role of entrepreneurial SE in the context of rural areas of south, this study cannot be separated from an analysis of the phenomenon in the rural context that characterizes the region in which the project operates.

Rural entrepreneurs experience more difficulties accessing key financial, technological, human and knowledge related resources than urban entrepreneurs, and lack certain benefits related to a low density population such as a lower density of markets and a greater distance to resources (Malecki, 2018). Despite this, Capelleras *et al.* (2013), analysing links between individual characteristics of entrepreneurs and the urban/rural environment, argued that individuals who perceive an opportunity in rural areas are more likely to become a nascent entrepreneurs.

At the same time, from the environment perspective, Wu and Mweemba (2010) evaluate farmers' awareness and attitude toward environmental degradation and their self-efficacy beliefs in Zambia, finding that farmers have a strong belief about their capacity to take action

to reduce land degradation on their farms. In this context, Shepherd and Patzelt (2011) define sustainable entrepreneurship as the activities performed by entrepreneurs in the pursuit of opportunities which do not undermine the ecological and social environments in which they operate. By contrast, when possible, they must restore or nurture such environments towards recovering the balance between nature, society and economic activity (Parrish, 2010).

In the literature, there are many examples of questionnaires aimed at the study of SE in different fields of research (Garaika and Margahana, 2019; Malandrakis *et al.*, 2019; Tannady *et al.*, 2019; Zuhir *et al.*, 2019). The economic-social situation typical of Tunisia, the project's objective, and the attention to environmental issues with a view to sustainable development, have led to the creation of questions specific to the present study.

The study was based on the assumption that SE consists in project participants' beliefs that they could utilize past experiences in economic, social and environmental fields, to mobilize cognitive resources, motivation, and courses of action needed to meet situational demands about their business project (Wood and Bandura, 1989). Thus, the questionnaire contained 11 items relating to economic (3 items), social (3 items) and environmental (5 items) aspects. Participants had to rate to what extent they related to these statements using a five-point Likert Scale from 0 "I definitely disagree" to 4 "I definitely agree" (Table 3).

The score of each question was assigned to the corresponding variable. Furthermore, an aggregate variable was created intended as the sum of the scores relating to a specific field.

6. Data collection

Data collection was carried out through a multi-step process. A group of aspiring entrepreneurs from the region were identified using lists provided by the technical partners on site, official administrations and other local partners involved in the project. An initial general interview was then carried out with all the individuals identified, useful for verifying:

Table 4 - Sample characteristics.

Attributes	n.	%
Gender		
Male	25	62,5
Female	15	37,5
Age		
Below 30	7	17,5
30-35	16	40,0
36-40	15	37,5
Over 40	2	5,0
Education Level		
Primary school	4	10,0
Secondary School	5	12,5
University	31	77,5
Total	40	100,0

- general information, education level and age;
- business sector of the project;
- type of company to be built or type of company that has already been officially registered;
- any activities implemented for the preliminary development of the business project.

As a result of this first contact, 40 aspiring entrepreneurs were selected who accepted to take part in the project (Table 4).

Only 32 of the 40 participants submitted the BP, which was then evaluated for financial aid.

The economic sectors influenced by the projects were seven, with a clear predominance of the productive sector over services (Figure 1).
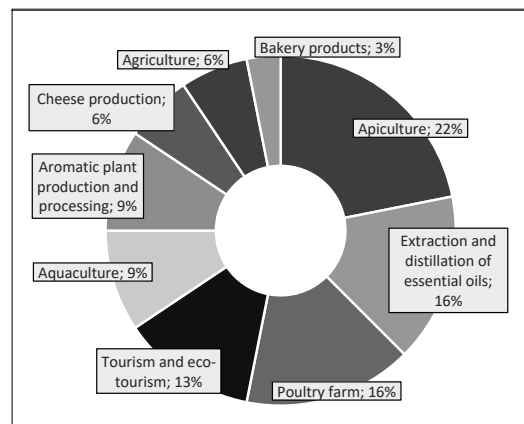
Figure 1 - Sectors affected by start-up projects.

Table 5 - Correlation of items and aggregated variables.

Variable	Ec1	Ec2	Ec3	So1	So2	So3	En1	En2	En3	En4	En5
Ec1	—										
Ec2	0.071	—									
Ec3	0.100	0.122	—								
So1	0.409 **	0.097	0.225	—							
So2	0.251	0.189	0.354 *	0.357 *	—						
So3	0.379 *	0.020	0.262	0.531 ***	0.605 ***	—					
En1	0.500 **	-0.135	0.171	0.357 *	0.303	0.534 ***	—				
En2	0.059	0.053	-0.123	0.298	0.407 **	0.354 *	0.280	—			
En3	-0.036	0.105	-0.051	0.264	0.394 *	0.348 *	0.260	0.602 ***	—		
En4	0.221	0.029	0.336 *	0.380 *	0.472 **	0.485 **	0.372 *	0.369 *	0.477 **	—	
En5	0.102	-0.110	0.483 **	0.285	0.439 **	0.464 **	0.268	0.148	0.055	0.096	—

Aggregated Variable	EC	SO	EN
EC	—		
SO	0.521 ***	—	
EN	0.356 *	0.734 ***	—

*Statistical significance * p < .05, ** p < .01, *** p < .001*

7. Correlation matrix and reliability test

A first analysis was carried out on the correlation of items to measure the degree of connection between the variables. The analysis was conducted on a dual level. The correlation was calculated at the level of individual items of the questionnaire and at the level of the three aggregate variables (Table 5).

To complement this analysis, a measure of the internal consistency was performed using Cronbach's alpha (1951), which indicates the stability of the form, and estimates to what extent the responses of a questionnaire, or parts of it, are reliable (Bujang et al., 2018). The value of Cronbach's alpha ranges from 0 to 1, with the higher values indicating that items are measuring the same dimension. By contrast, when it is approximately close to zero, it means that some or all of the items are not measuring the same dimension (Leontitsis and Pagge, 2007). Nunnally (1978) considers a level of 0.7 to be acceptable. Furthermore, in this case the analysis was carried out on two different levels. The first is the one that examines each item without considering whether it belongs to a specific field or

Table 6 - Reliability of scales.

Reliability	Items	Cronbach's alpha
Variables	11	0,814
Aggregated variables	3	0,749

not, and the second one examines the measure of the reliability of the questionnaire based on the three aggregated variables (Table 6). The results achieved up to this point have served as a reliable foundation for further testing and subsequent analysis.

8. Principal Component Analysis (PCA) and Logit model

Principal Component Analysis (PCA) is a powerful method with which to explore datasets that feature multiple variables (Jollife and Cadima, 2016). In the literature, there are many examples which use this methodology in various fields of research (Jeon et al., 2006; Capitanio et al., 2009; Naseri and Sharifi, 2019; Luo et al., 2020).

PCA analysis was performed to identify a few

Table 7 - Matrix of component loadings.

Variable	PC1	PC2	PC3	PC4
Ec1		1.130		
Ec2				0.940
Ec3			0.990	
So1		0.578		
So2			0.496	
So3				
En1		0.747		
En2	0.980			
En3	1.044			
En4	0.535			
En5			0.949	

Note: Applied rotation method is PROMAX.

complex indicators that mostly characterize the differentiations among entrepreneurs' answers and synthesize the original variables with a minimal loss of information. New variables, called principal components (PCs), are linear functions of those in the original dataset (Jackson, 2005).

Table 7 shows the matrix of component loadings (highlighted > 0.39), i.e. the correlations between the initial variables and each of the principal components (eigenvalues >1). An oblique rotation method (PROMAX) was applied. We extracted four factors that explain more than 71 per cent of the initial variance.

The first component is directly linked to various SE environmental aspects, in particular it is correlated to the elements of responsible use of water (En2), the reduction of water waste (En3) and to the knowledge and use of energy from renewable sources (En4). The second and third components are more transversal, taking into account all three subjects of the SE. The variable PC2 refers to the commercial skills of the participants (Ec1), to their involvement in social relations (So1) and to their experiences in the field of waste management (En1), while PC3 refers to participants' skill in terms of building with local materials (Ec3), knowledge of traditions (So2) and the sustainable exploitation of protected areas (En5). The variable related to awareness of the local population about

environmental issue, appears to be uncorrelated to any of the principal factors.

The last principal component (PC4) is strongly related to only one element of the economic field, that is self-consumption (Ec2). However, the systemic approach adopted in the formulation of the SE framework which takes into account the multidimensionality of the individuals' self-beliefs, has led to the exclusion of this last component for further testing, since it refers to the only one variable that has no correlation to all the other elements considered, as seen in Table 5. In this formulation, the model still explains 61 percent of the total variance.

To determine the effect of SE on the propensity to submit the BP for the financial aid assessment and verify whether the effect differs according to different PCs, a logit regression model is used. In this case, the dependent variable takes a value of 1 when the observed participant submitted a BP, and 0 otherwise. The logit specification provides a model of the probability as follows:

$$P_i = \Pr(Y_i = 1|X_i) = E(Y = 1|X_i) = \\ 1/1 + e^{-(\alpha + \beta X_i)} = 1/1 + e^{-Z_i} \quad (1)$$

that indicates the impact of independent variables on the probability that a participant submits the BP for the financial aid evaluation. The last part of the equation:

$$P_i = 1/1 + e^{-Z_i} \quad (2)$$

represents the logistic distribution function, which ranges from 0 to 1, and thus ensures that for every estimated X_i, P_i can be interpreted as a probability. According to Wooldridge (2010), it fulfils the requirement $0 \leq E(Y_i|X_i) \leq 1$ and it is one of the main reasons for choosing a logit model for this analysis.

The equation (2) needs to be rewritten so that it becomes linear in X_i and β, to be used to estimate P_i and transform the logit model as follows:

$$\ln(P_i/1 - P_i) = \alpha + \beta X_i + \varepsilon_i \quad (3)$$

where the dependent variable is the logarithms of the odds ratio of BP submitted by participants and ε_i represents the stochastic disturbance term. Despite the fact that this estimation should be interpreted cautiously for relatively small samples such as ours (Stock and Watson, 2014), the

Table 8 - SE Principal Component affecting participant BP submission.

	Estimate		Standard Error	Wald Statistic	p
PC1	-0.094		0.176	0.285	0.593
PC2	0.198	*	0.093	4.508	0.034
PC3	0.096		0.185	0.268	0.605

*Statistical significance * p < .05.*

estimated parameters β, can be interpreted as the change in the odds for the probability the participants will submit their BP for financial aid evaluation. Positive values for β, implies that increasing X_i will increase this probability; negative values implies the opposite (Gujarati, 2004).

The variables included in the model are those identified by the previous PCA analysis, and in particular, the sum of the scores assigned by the participants to the questions corresponding to the individual items.

Hence the corresponding equation is:

$$BP = \beta_1 PC1 + \beta_2 PC2 + \beta_3 PC3 \qquad (4)$$

where $PC1 = \sum_{i=0}^{n} En2_i + En3_i + En4_i$, $PC2 =$

$$\sum_{i=0}^{n} Ec1_i + So1_i + En1_i$$

and $PC3 = \sum_{i=0}^{n} Ec3_i + So2_i + En5_i$.

Table 8 summarizes the results of the estimates and therefore the factors of the SE that influence participants to submit BPs for the financial aid assessment.

9. Results

The analyses carried out on the sample of participants in the Development Cooperation project made it possible to clarify many aspects related to self-efficacy in rural contexts such as the Kroumerie-Mogod region. The correlation table of the questionnaire items that have been developed, shows a strong correlation between social and environmental items. It is surprising how the economic elements are, on the other hand, much less significantly correlated to all the others (Table 5).

However, the questionnaire was found reliable, both considering the set of all items, and considering the aggregates in the three main areas of investigation, economic, social and environmental (Table 6).
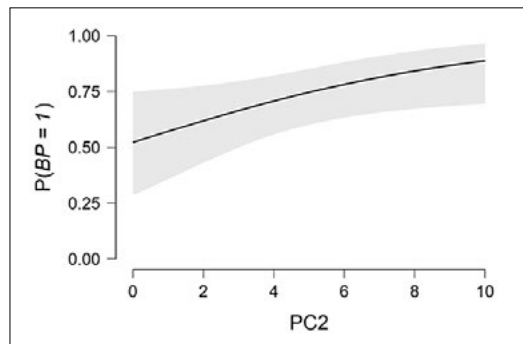
As for the PCA analysis, it was possible to highlight the existence of four different main components, with an explanation of the variance of over 70 percent. The first of the three considered, concerns the environmental sphere, which is related to water management and the use of energy from renewable resources. This denotes how the experiences and skills acquired in environmental issues represent great importance for participants in promoting their own entrepreneurial project.

The second and third principal components are however more transversal and take into consideration all three dimensions of sustainability (economic, social, environmental) investigated by the questionnaire. The participant's experiences related to commercial, social and waste management issues on the one hand, and to building with local materials, knowledge of local traditions and skills regarding the sustainable exploitation of resources on the other hand, allow them to face the challenges related to the development of their own business project.

At the same time, it is interesting how the experiences regarding the awareness of environmental issues do not emerge as a principal component of the participant's SE.

The second of these three variables analysed, is the one with a statistically significant influence on the probability of an individual promoting a personal business project. This result confirms the hypothesis that a strong SE positively affects the participants' decision to submit the BP. Figure 2 shows how an increase in the ag-

Figure 2 - Probability to submit the BP based on PC2.

gregate scores of the items of *PC2* positively affects the probability that the young entrepreneur promotes and submits the BP.

This result offers the key to understanding how SE can affect the entrepreneurial initiative of rural populations. The experiences in the commercial field and in the social commitments sphere, together with skills acquired in the field of waste management, have a decisive and significant impact in the promotion of personal entrepreneurial projects in agri-food sector.

10. Conclusions

In the rural context characteristic of African countries, agriculture can make a decisive contribution to a sustainable development of the Mediterranean area. Tunisia is one of the major countries in north Africa but the agri-food sector, despite the great opportunities offered by the territory, still remains afflicted by a strong lack of private investment and infrastructure, which limits Tunisian farming productivity (Boughzala and Tlili Hamdi, 2014).

Young entrepreneurship in agri-food sector is considered as one of the main elements for embarking on a path towards sustainable development that can significantly contribute to improve the lives of the inhabitants of the African countries. This study proposed an unprecedented analysis in Tunisia, investigating the self-efficacy of the participants in the "Start-up Tunisie" project and identifying a positive relationship between some of their experiences, and their willingness to effectively promote own entrepreneurial projects.

In the North African context, Development Cooperation projects plays a crucial role in knowledge transfer and in the adaptation of tools, methodologies, practices or organizational models, to support decisively new start-ups. This investigation represents a first step towards a more in-depth analysis of the self-efficacy in rural context and its relationship with the effectiveness of Development Cooperation (Picciotto, 2002).

The project financed fifteen start-ups and the results of the activities were satisfactory. The improvement of the production, processing and distribution structures has resulted in an increase in revenues and employees, as well as in a general emergence of informal jobs. A year after the start of the project, all the companies implemented their activities and improved their economic outlook. In the year following the financing, 10 out of 15 companies exceeded the estimated revenues at the start of the project, while 7 companies hired new employees.

Some companies represent clear examples of good practices with respect to the standards of the socio-economic contexts in which they operate and commercial relationships have been created among the various beneficiaries, which amplify the positive effect at the local level.

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