

ORGANIZATIONAL INFORMATION

Editor-in-chief  
Cosimo Iacirignola  
Director IAM of Bari  
Via Ceglie 9 - 70010 VALENZANO (BARI)

Managing Editor  
Giulio Malorgio  
Dipartimento di Economia e Ingegneria Agrarie  
Via Fanin, 50 - 40127 BOLOGNA  
Tel. ++39 051 2096145  
Fax ++39 051 2096162  
e-mail: giulio.malorgio@unibo.it

Editorial office  
Istituto Agronomico Mediterraneo del CIHEAM  
via Ceglie, 9 - 70010 VALENZANO (BARI)  
Tel. ++39 080 4606271  
Fax ++39 080 4606271

Editorial secretariat  
Stefania Lapedota: lapedotas@iamb.it

Copyright  
CIHEAM - Istituto Agronomico Mediterraneo di Bari

The contributed articles do not imply the expression of any opinion whatsoever on the part of CIHEAM - IAM of Bari. They report the author's opinions.

*L'IAM de Bari du CIHEAM n'entend donner aucune approbation ni improbation aux opinions émises dans les articles. Ces opinions n'engagent que leur auteur.*

The editorial office reserves the right to revise the contributions, in view of adapting them for the publication.

*La direction de la revue se réserve le droit de réviser les travaux présentés en vue de les adapter à la publication.*

Publisher  
Edizioni Dedalo s.r.l.  
on behalf of CIHEAM - IAM of Bari

Administration and Subscription Office  
Edizioni Dedalo s.r.l.  
v.le Luigi Jacobini, 5  
Zona Industriale - Bari 70123  
Casella Postale BA/19, Bari 70123  
Tel. 080/531.14.13 (pbx)  
Fax 080/531.14.14  
e-mail: info@edizionidedalo.it  
www.edizionidedalo.it

Subscription rate  
Italy: 45 Euro, Foreign: 90 Euro

Postal Current Account n. 11639705  
in the name of:  
Edizioni Dedalo s.r.l., Bari

Advertising/Publicité  
Edizioni Dedalo s.r.l., Bari

New MEDIT is indexed and abstracted in:  
CAB ABSTRACTS, AGRIS/FAO database, EconLit,  
ISI Web of Science

New MEDIT web page:  
www.iamb.it/resouce/public/newmedit

ISSN: 1594-5685

Registrazione  
Tribunale di Bari, n. 1546 del 4.1.2002

Direttore Responsabile  
Giulio Malorgio

Stampa  
Dedalo Litostampa s.r.l., Bari

NEW MEDIT è associato alla  
Unione  
Stampa  
Periodica  
Italiana



# NEW MEDIT

## Vol. VIII - n. 1/2009

*Mediterranean Journal  
of Economics, Agriculture  
and Environment*

*Revue Méditerranéenne  
d'Economie, Agriculture  
et Environnement*

### CONTENTS / SOMMAIRE

- Editorial/Editorial** pag. 2  
**JOSÉ M. GIL**  
**Mediterranean Diet And Health**
- Pedro Damião de Sousa HENRIQUES, aria Leonor da Silva CARVALHO, Rui Manuel de Sosa FRAGOSO** pag. 4  
**Technical Efficiency Of Portuguese Wine Farms**  
*Efficiency technique des exploitations viticoles portugaises*
- ABDERRAOUF LAAJIMI, JAMEL BEN NASR** pag. 10  
**Appréciation et comparaison de la durabilité des exploitations agricoles biologiques et conventionnelles en Tunisie: Cas de l'oléiculture dans la région de Sfax**  
*Assessment of sustainability and comparison between organic and conventional farms in Tunisia: case of olivegrowing activities in Sfax region*
- THEODORE METAXAS** pag. 20  
**Building an Attractive Investment Image: An Entrepreneurial Perspective for The City of Larissa, in Thessaly Region, Greece**  
*Créer une image attractive pour les investissements: une perspective d'entreprise pour la ville de Larissa, dans la région de Thessalie, en Grèce*
- NIHAYA OUNALLI, MONGI SGHAIER** pag. 31  
**Contribution à l'optimisation de l'allocation des ressources en eau et sol dans les systèmes de production du bassin versant de l'Oued Oum Zessar (Sud-est de la Tunisie)**  
*Contribution to the optimization of the water and soil resources distribution in the production systems of the watershed of Oued Oum Zessar (South-Eastern Tunisia)*
- LUCA MULAZZANI, GIULIO MALORGIO** pag. 37  
**Market dynamics and commercial flows in the Mediterranean area: triangular effects among the Eu, the MPCs and Italy in the fruit and vegetable sector**  
*Dynamiques de marché et échanges commerciaux dans le pourtour méditerranéen: effets triangulaires entre l'UE, les PPM et l'Italie dans le secteur des fruits et légumes*
- AZZEDINE MED TOUFFIK ARFA, MED EL HABIB BENDERRADJI, DJAMEL ALATOU** pag. 46  
**Analyse des Bilans des incendies de Forêt et leur Impact Economique en Algérie entre 1985 et 2006**  
*Statistics on forest fire and analysis of their economic impact in Algeria between 1985 and 2006*
- MBAREK GHZAIEL, MOHAMED RAZEK JEDAY, MOHAMED JAOUAD** pag. 52  
**Energies renouvelables et enjeux du développement: Modélisation du coût de pompage de l'eau: cas des zones arides du Sud tunisien**  
*Renewable energy and development issues: modelling of water pumping costs: case of the arid regions in Southern Tunisia*
- GIOVANNI LAGIOIA, ANNARITA PAIANO, Teodoro GALLUCCI** pag. 58  
**Opportunities and challenges of the biotechnology in sector in Apulia**  
*Chances et défis du secteur des biotechnologies dans les Pouilles*

## Mediterranean Diet And Health

JOSÉ M. GIL\*

Traditionally, the existence of a “Mediterranean Diet” has been considered the most important agglutinating factor for Mediterranean countries and, at the same time, as something differentiating them from other geographical regions. The concept of Mediterranean diet appeared in the late 50’s referring to the different food habits observed mainly in some parts of Southern Italy and Greece (Crete) (as well as in Spain, Portugal and Cyprus) characterized by a high consumption of fruits, vegetables, bread and other cereals, potatoes, beans, nuts and seeds; olive oil as the key monounsaturated fat source; grilled or steamed chicken and seafood (as opposed to red meat) plus a glass or two of red wine.

It was observed that the life expectancy of adults in these areas at that time was among the longest in the world. Furthermore, the incidence of certain cancers and heart diseases was among the lowest within European countries. Based on these findings, clinical trials of similar diets imposed on patients with coronary disease or after a recent myocardial infarction showed that they experienced fewer deaths and fewer coronary events than patients who had other diets. As the so-called traditional Mediterranean Diet was very close to the dietary recommendations of the American Heart Association, the concept of Mediterranean Diet-style gained ground among nutritionists and social scientists in the last decades. However, this Mediterranean Diet-style is nowadays far from being applicable to the existing diet in the 16 Mediterranean countries. Moreover, the existing diet in most countries cannot be longer identified as “Healthy” as it was in the past. In my opinion, and at least in Northern Mediterranean countries, such identification has delayed the implementation of food policies specifically addressed to improve the health status of the population.

Several studies have analyzed food consumption patterns in the Mediterranean countries. All of them differentiate, at least, between Northern and Southern countries, being the consumption of calories from animal origin the main source of differentiation. Religious issues can only explain partially such differences, as if we eliminate pork consumption in Northern Mediterranean countries, the gap between the two shores still is very high. So, we have to rely on other factors from which, as a social scientist, I would mention income and relative prices.

In relation to income, it is well known that every process of economic development is linked to a more satisfactory situation as for the nutritional quality of the population’s diet. However, such improvement, usually measured as the increasing intake of calories, is not proportional to income increases (food expenditure elasticity tend to be higher than the calorie intake elasticity). Furthermore, the latter can be negative once a given per capita income level has attained.

During the last few decades, food diets have transformed substantially as a result of multiple factors from which technical change along the food chain has played a pivotal role. In fact, the modernization of the food chain has increased productivity and resulted in three major consequences: 1) increasing excess supply and decreasing real food prices; 2) a deep industrialization of agrarian societies helping them to accumulate capital, free up labor and provide more nutritious and value added food; and 3) a substantial transformation of citizens’ lifestyles as a consequence of rising income, urbanization and changes in food sector.

These changes have generated two important consequences on food demand: 1) the declining of real food prices has generated not only an increase of total calorie intake but also a shift towards a higher calorie density di-

\* CREDA-UPC-IRTA (Castelldefels, Barcelona, Spain)

et that is richer in cholesterol and saturated fats (i.e. higher consumption of meat, eggs, dairy products and sugar); and 2) the increasing sedentary lifestyle has made calories expenditures to decline. As a result of both trends, food diets in both developed and developing countries (Mediterranean countries not being an exception) have become clearly imbalanced with negative consequences on population's health.

How far are now food consumption patterns in Mediterranean countries from the so defined "Ideal" Mediterranean diet? Some indices have been generated in the literature to measure the adequacy of the existing diet to the "Ideal" one. Let me cite, as the most relevant, the Mediterranean Diet Score (MDS) or the Healthy Diet Indicator (HDI). Both are based on aggregating zero/one scores (if the consumption level of a specific food group is above the "ideal" average a unit value is assigned, and zero, otherwise). While MDS is based on average ideal values of the Mediterranean Diet, the HDI is based on the World Health Organization (WHO) recommendations. Both are mainly based on products rather than on nutrients, although the second one combines both aspects. Another widely used measure is the Mediterranean Adequacy Index (MAI) which is computed by dividing the sum of the percentage of total daily energy intake coming from Mediterranean food groups (bread, cereals, legumes, potatoes, vegetables, fruit, vegetable oils, fish and red wine) by the sum of the percentage coming from non-Mediterranean food groups (milk and dairy products, meat and poultry, sugar, saturated fat and eggs). The MAI has passed from 3.6 to 2.8, in Algeria, from 1960-65 to 2000-03; from 4.9 to 4.1, in Egypt; from 3.4 to 3.3, in Morocco; from 4.6 to 2.1, in Tunisia; from 5.6 to 2.0, in Greece (the origin of the Mediterranean Diet); from 3.3 to 1.6, in Italy; and from 3.4 to 1.2, in Spain. For comparison purposes, for the last period, in United Kingdom, Sweden, Denmark and Norway the average MAI was 0.9, 0.8, 0.8 and 1, respectively.

In any case, I suggest that more research is needed in order to define more accurate indices. May be we need a lot of further multidisciplinary research in order to better quantify what we understand for the Mediterranean Diet (also I would include a discussion about the appropriateness of the name). The current Mediterranean Diet Pyramid is very vague (I believe that conscientiously vague) in order to define indices as those we have just mentioned. If we agree that indices are necessary, then we have to pay attention to different issues: 1) the balance of products and nutrients in the index; 2) to con-

sider not only average recommended values but also minimum and maximum requirements based on current research undertaken by nutritionists; 3) indices cannot be based on simply aggregating zero/one values; and 4) how products and nutrients have to be combined within the index.

But let me come back to the traditional identification between Mediterranean Diet and Health. Let us consider the prevalence of obesity as a reasonable indicator of the health status of the society for two reasons: 1) this is a topic that has generated a lot of research during the last years and, as a consequence, some comparable information among countries has been gathered; and 2) although the WHO characterizes overweight and obesity as diseases, it is also well known that both (together with smoking) are key determinants in the incidence of the most important contemporary chronic diseases, such as cancer, cardiovascular problems, certain types of diabetes, etc. For the last year the information is available, the prevalence of obesity and overweight was: 96.3% in Egypt (2005); 61.1%, in Morocco (2001), 58.2%, in Tunisia (1997); 79%, in Greece (2004); 45.4%, in Italy (2003) or 62.3%, in Spain (2003). Comparing these figures with those of the MAI, in Southern Mediterranean countries the higher MDI is associated with a higher prevalence of obesity. In relation to Northern Mediterranean countries, the case of Greece is noticeably. Additionally, in the North, the islands of Malta, Sicily, Gibraltar and Crete as well as Spain, Portugal and Italy report overweight and obesity levels exceeding 30% among children aged 7-11. In the South, the double burden of malnutrition has been reported in countries with rapid economic transition, especially in Egypt.

To conclude, let me suggest some final points. First, taking into account the current status of food diets in most Mediterranean countries, I would suggest avoiding talking about Mediterranean Diet-style. Let us talk about Healthy Diet or Recommended Diet or any alternative name. Second, the Mediterranean countries are facing big health problems associated to food consumption patterns. We can not delay the re-definition of food policies in those countries, which has to be coordinated with other agricultural and/or trade policies. And third, there is a lack of available periodic information in all countries about food diets (only data on food consumption, if existing, is available), lifestyles and health status of the population, which makes difficult to understand the real nature of the problem. A lot of effort has to be done by public authorities to improve decision making.

### ▪ Technical efficiency of Portuguese wine farms

**Pedro Damião de Sousa HENRIQUES**

**Maria Leonor da Silva CARVALHO**

Department of Economics, University of Evora  
Evora, Portugal

**Rui Manuel de Sousa FRAGOSO**

Department of Management, University of Evora  
Evora, Portugal

Jel classification: Q120, D200

#### **Abstract**

The objective of this study is to measure the levels of technical efficiency of a sample of wine-making farms, in the Portuguese Alentejo region, and relate these efficiency levels to some farm characteristics such as: physical and economic size, farmers' age, land property, irrigation, labour use, and area and product specialization. The methodology chosen to measure the individual levels of efficiency was non-parametric due to the advantage of not defining a functional form for the production technology.

Results show that wine-producing farms could increase the efficiency of input use. The scale and congestion inefficiencies are responsible for most of the observed technical inefficiency. The technical efficiency increases with specialization.

**Key words:** technical efficiency, non-parametric, vineyard, wine

#### **Résumé**

Cette étude a l'objectif de mesurer les niveaux d'efficacité technique d'un échantillon d'exploitations productrices de vin appartenant à la région de l'Alentejo et de les mettre en relation avec certaines caractéristiques de ces mêmes exploitations, telles que: la dimension physique et économique, l'âge, les formes de propriété foncière, l'irrigation, le type de main-d'œuvre et la spécialisation culturelle et productive. En tenant compte de l'avantage de ne pas définir une forme fonctionnelle pour la technologie de production, la méthodologie non-paramétrique a été choisie afin de mesurer les niveaux individuels d'efficacité.

Les résultats obtenus montrent que pour ces exploitations il y a de la marge pour augmenter les niveaux d'efficacité dans l'utilisation des facteurs de production, les inefficiences d'échelle et de sur-utilisation provoquant une grande partie de l'inefficacité technique observée.

Une augmentation de l'efficacité technique a été constatée en relation avec l'augmentation de la spécialisation exprimée en termes de la surface de la vigne ou de la valeur du produit de la vigne par rapport au produit total.

**Mots clés :** efficacité technique, non-paramétrique, vignoble, vin

▪ **Appréciation et comparaison de la durabilité des exploitations agricoles biologiques et conventionnelles en Tunisie : cas de l'oléiculture dans la région de SFAX**

**Abderraouf LAAJIMI**

**Jamel BEN NASR**

Département d'Economie, Gestion agricole et Agroalimentaire  
Institut National Agronomique de Tunisie  
Tunis, Tunisie

Jel classification: Q120, Q010

**Abstract**

This research has been carried out to assess the sustainability of the Tunisian olive-growing farms and to compare the sustainability level of organic and conventional farms. A survey of 62 olive growers was conducted in the region of Sfax in Tunisia. An empirical analysis was done to evaluate the sustainability of the organic farms compared to the conventional ones according to the French "IDEA" method (Farms Sustainability Indicators). The "IDEA" indicators suggested a higher ranking of the organic farms on the sustainability scale, which confirms the assumption that organic farming is more sustainable than conventional agriculture. Also, this investigation highlighted the importance of organic farming as a sustainable production method on three scales: ecological, socio-territorial and economic.

**Key words:** olive-growing farms, organic production, sustainability, Tunisia

**Résumé**

La présente étude a été menée en vue d'évaluer la durabilité des exploitations oléicoles tunisiennes et de comparer le niveau de durabilité du mode de production biologique par rapport au mode conventionnel. Sur la base d'un échantillon de 62 agriculteurs, appartenant au gouvernorat de Sfax, choisi comme zone d'étude, une analyse empirique a permis d'apprécier et de comparer la durabilité des deux types d'exploitations oléicoles sur la base du calcul de quelques indicateurs de durabilité inspirés de la méthode IDEA (Indicateurs de la durabilité des exploitations agricoles). La combinaison des indicateurs calculés a montré un classement supérieur des exploitations conduites en mode biologique sur l'échelle de la durabilité, ce qui conforte l'hypothèse de la durabilité du mode biologique par rapport au mode conventionnel. L'analyse a permis aussi de mettre en évidence l'importance de l'agriculture biologique comme un mode d'agriculture durable sur les trois échelles: écologique, socio-territoriale et économique.

**Mots clés :** exploitations oléicoles, production biologique, durabilité, Tunisie

▪ **Building an attractive investment image: an entrepreneurial perspective for the city of Larissa in Thessaly Region, Greece**

**Theodore METAXAS**  
Department of Planning and Regional Development  
University of Thessaly  
Larissa, Greece

Jel classification: L500, R500

**Abstract**

The new economic and social structural changes, both at an international and European level, have influenced the cities' profile by creating high-level competitiveness and attractiveness within various cities. This fact leads to the conclusion that we are standing before a new form of competition, where cities are trying to attract investments aimed at boosting their economic development and high-level competitiveness between each other. The present article examines the case of the city of Larissa, Thessaly region, Greece, as an investment destination for businesses development. We use both original and derivative empirical data from 114 firms in the area of Larissa City, which evaluate the city's advantages, the frequency of implementation of development policies and also the potential for cooperation with local public factors for a joint promotion and support of the city's image as an attractive and competitive investment destination. The article draws important conclusions concerning both the city and companies that participated in the survey.

**Key words:** attractive investment image, firms' development policies, primary research, Larissa city, Greece

**Résumé**

A l'échelle internationale et européenne, les récents changements structurels de l'économie et de la société ont eu une certaine influence sur le profil des villes en créant un haut niveau de compétitivité et d'attractivité. Ceci a provoqué la naissance d'une nouvelle forme de compétition parmi les villes qui visent à attirer les investissements afin d'accélérer leur développement économique et de créer un haut niveau de compétitivité. Le présent article analyse le cas de la ville de Larissa, dans la région de Thessalie, en Grèce, vue comme destination des flux d'investissement visant à favoriser le développement des entreprises locales. Nous avons utilisé les données empiriques concernant 114 entreprises dont le siège est à Larissa City, et qui évaluent les avantages de la ville, la fréquence de mise en œuvre des politiques de développement, et aussi le potentiel pour établir une bonne coopération avec les acteurs locaux dans la promotion conjointe de l'image de la ville en tant que destination des investissements attractive et compétitive. Cet article tire des conclusions importantes sur la ville et les entreprises qui ont fait l'objet de l'étude.

**Mots clés :** image attractive pour les investissements, politique de développement des entreprises, recherche primaire, ville de Larissa, Grèce

- **Contribution à l'optimisation de l'allocation des ressources en eau et en sol dans les systèmes de production du bassin versant de l'Oued Oum Zessar (Sud-est de la Tunisie)**

**Nihaya OUNALLI**

**Mongi SGHAIER**

Laboratoire d'Economie et Sociétés Rurales

Institut des Régions Arides de Médenine

Médenine 4119, Tunisie

Jel classification: C610, Q240

### **Résumé**

Cet article a pour objectif de contribuer à la conception d'un schéma d'allocation optimale des ressources en eau et en sol dans les systèmes de production du bassin versant de l'Oued Oum Zessar (Gouvernorat de Médenine, Sud-est de la Tunisie), moyennant la programmation multi-objectif de compromis. C'est ainsi qu'un ensemble de solutions optimales de compromis entre l'objectif d'efficacité économique et celui de minimisation des coûts de dégradation du sol a été déterminé. L'estimation des coûts des pertes en sol est rendue possible grâce à la méthode d'évaluation contingente.

**Mots clés :** allocation optimale, programmation multi-objectif de compromis, ressources en eau et en sol, dégradation du sol, bassin d'Oum Zessar, Tunisie

### **Abstract**

This paper aims to support the development of an optimal water and soil resources allocation scheme for Oum Zessar watershed production systems (province of Medenine, South-east Tunisia), by applying a multiobjective compromise programming. To this end a set of optimal compromise solutions between economic efficiency and soil degradation reduction costs was determined. Soil degradation costs were estimated by the contingent evaluation method.

**Key words:** optimal allocation, multiobjective compromise programming, soil and water resources, soil degradation, Oum Zessar watershed, Tunisia

- **Market dynamics and commercial flows in the Mediterranean area: triangular effects among the EU, the MPCs and Italy in the fruit and vegetable sector**

**Luca MULLAZZANI**

**Giulio MALORGIO**

Department of Agricultural Economics and Engineering  
Bologna University  
Bologna, Italy

Jel classification: Q170, F140

### **Abstract**

Political agreements and entrepreneurial relationships are two key factors for the development of the agri-food trade between the Mediterranean Countries and Europe. For its geographical position, Italy should be able to intercept the primary products from the Mediterranean Countries and work as a logistic base for processing and distribution. This paper aims to examine if the patterns and trends of the fruit and vegetable exports are different from the Mediterranean Countries to Italy and to Europe, confirming the existence of special relationships. At the same time, the paper examines the export trend from Italy to Europe and from Europe to Italy. The Constant Market Share Analysis has been performed to evaluate the import from the Mediterranean Countries as a whole and from several selected nations (Turkey, Egypt, Israel and Morocco). Conclusions show special relations between Italy and Turkey in the trade of shell fruits, while Egypt is increasing its competitiveness in all sectors choosing Italy as preferential partner.

**Key words:** agri-food trade, Mediterranean countries, fruits and vegetables

### **Résumé**

Les accords politiques et les relations entrepreneuriales sont deux facteurs clés jouant un rôle fondamental dans le développement des échanges commerciaux de produits agroalimentaires entre les Pays Méditerranéens et l'Europe. Grâce à sa position géographique, l'Italie devrait être capable d'intercepter les produits provenant des Pays Méditerranéens et de servir en base logistique pour la transformation et distribution des produits agroalimentaires. Ce document a le but ultime de comprendre s'il y a des différences entre Pays Méditerranéens, Italie et Europe en termes de comportements et tendances de l'exportation de fruits et légumes, tout en confirmant l'existence de relations spéciales. En même temps, cet article analyse les tendances des exportations depuis l'Italie à l'Europe et depuis l'Europe à l'Italie. Nous avons fait l'analyse du Constant Market Share (part de marché constante) pour évaluer l'importation depuis les Pays Méditerranéens en général et depuis différentes nations en particulier (Turquie, Egypte, Israël, Maroc). Les conclusions tirées montrent l'existence de relations spéciales entre l'Italie et la Turquie dans le commerce de fruits-à-coques, tandis que l'Egypte montre d'être de plus en plus compétitif dans tous les secteurs et d'avoir choisi l'Italie en tant que partenaire préférentiel.

**Mots clés:** commerce de produits agro-alimentaires, Pays méditerranéens, fruits et légumes

▪ **Analyse des bilans des incendies de forêt et leur impact économique en Algérie entre 1985 et 2006**

**Azzedine Med Touffik ARFA**  
**Med El Habib BENDERRADJI**  
**Djamel ALATOU**  
Département de Biologie et Ecologie  
Université Mentouri,  
Constantine, Algérie

Jel classification: Q230

**Résumé**

L'Algérie constitue une entité écologique exceptionnelle dans la biosphère. Cependant, la croissance démographique galopante, les conditions climatiques difficiles, la surexploitation des ressources naturelles ont généré des problèmes de dégradation de l'environnement. Par ailleurs, l'élément naturel, qui est sujet à plus de dégradation, demeure le milieu forestier qui subit d'énormes pertes aussi bien sur le plan floristique que faunistique. La forêt algérienne, actuellement fragile, a besoin d'être protégée car la déforestation ne cesse de s'accroître en raison des incendies de forêt répétés. Au cours des deux dernières décennies (1985-2006), les incendies de forêt ont dévasté l'équivalent de 779 872,11 ha pour un nombre total de 32 354 foyers. Eu égard à cette situation, l'Algérie figure au premier rang parmi les pays qui devraient bénéficier impérativement de strictes mesures de protection puisqu'elle présente de nombreux atouts liés à sa grande diversité biologique et qui ont un impact son équilibre socioéconomique.

**Mots clés :** incendie de forêt, bilan, coûts financiers, Algérie

**Abstract**

Algeria is an exceptional ecological entity in the biosphere. However, the galloping population growth, the difficult climatic conditions, and the overexploitation of natural resources have generated problems that led to the degradation of the environment. The natural element subject to most degradation is the forest, which suffers very heavy losses in its flora as well as in its fauna. The Algerian forest, currently fragile, needs protection since deforestation is constantly gaining in extent due to repeated forest fires. During the two previous decades (1985-2006), forest fires, originating in 32354 locations, destroyed 779872.11 ha. Considering this situation, Algeria is among the countries most in need of strict forest protection measures in order to preserve its assets stemming from great biological diversity and strong impact on the socio-economic equilibrium of the country.

**Key words:** forest fires, fire statistics, financial costs, Algeria

▪ **Energies renouvelables et enjeux du développement**  
**Modélisation du coût de pompage de l'eau : cas des zones arides du Sud tunisien**

**Mbarek GHZAIEL**

**Mohamed Razek JEDAY**

Unité de Recherche énergétique et Environnement  
Ecole Nationale des Ingénieurs de Gabès,  
Gabès, Tunisie

**Mohamed JAOUAD**

Institut des Régions Arides de Médenine  
Médenine, Tunisie

Jel classification: Q120, Q610

**Résumé**

Les énergies renouvelables trouvent leur place actuellement et ont un avenir certain. Les systèmes de pompage photovoltaïques restent la meilleure solution pour l'accès à l'eau dans les zones arides, surtout dans les sites lointains. Dans cet article, nous allons passer en revue la modélisation du coût de revient de l'eau pompée au moyen des systèmes PV en milieu aride et notamment, dans la région de Kébili, Médenine, Gabès et Tozeur, dans le Sud de la Tunisie. L'objectif est donc l'élaboration d'un modèle pour chaque site, simple et opérationnel, permettant de calculer le coût de revient d'un m<sup>3</sup> d'eau pompée, en introduisant seulement le besoin annuel en eau et la hauteur manométrique totale. Le modèle révèle que le coût moyen de pompage dépend largement de la quantité d'eau fournie ainsi que de la hauteur manométrique totale et ce, dans le cas des deux nappes (phréatique et souterraine). Le coût de revient est en moyenne de 542 millimes pour la nappe phréatique et de 801 millimes pour la nappe souterraine, ce qui implique une augmentation moyenne de 47 % pour les 4 sites de Kébili, Médenine, Gabès et Tozeur.

**Mots clés** : modélisation, énergies renouvelables, coût, eau pompée, zone aride, Tunisie

**Abstract**

Renewable energies have an important place today and yet still a future ahead. Photovoltaic (PV) pumping systems remain the best solution for access to water in dry areas, especially in remote regions. In this paper we shall review modeling of water pumping cost using PV systems in some dry areas i.e. Kébili, Médenine, Gabès and Tozeur in south Tunisia. The goal is the elaboration of a simple and operational model for every site, which allows calculating the production cost of a m<sup>3</sup> of pumped water, taking into account only the annual water need and the total manometric height. The model indicates that average pumping cost greatly depends on the amount of water supplied and on the total manometric height for both unconfined aquifer and groundwater. The production cost is on average 542 millimes and 801 millimes, respectively for unconfined aquifer and groundwater, that is to say an average increase of about 47 % for the 4 sites of Kébili, Médenine, Gabès and Tozeur.

**Key words**: modeling, renewable energies, cost, water pumping, dry area, Tunisia

- **Opportunities and challenges of the biotechnology sector in Apulia**

**Giovanni LAGIOIA**

**Annarita PAIANO**

**Teodoro GALLUCCI**

Department of Geographical and Commodity Science

Faculty of Economics, University of Bari

Bari, Italy

Jel classification: Q160, O330

***Abstract***

Biotechnology offers new opportunities to meet many needs of economic growth, public health and environmental protection. This can represent an immediate and potential advantage for businesses and policy makers. In this article, national, European and international markets will be evaluated on the basis of their economic, social and environmental aspects in order to highlight the Biotechnology features that have been set up over the last few years and understand its possible future applications. Opportunities for its development at a more local level, the regional one, will be taken into account.

***Résumé***

Les biotechnologies offrent des nouvelles possibilités pour satisfaire les besoins concernant la croissance économique, la santé publique et la protection environnementale. Ceci pourrait représenter un avantage immédiat et potentiel pour les entreprises et les décideurs politiques. Cet article fait une évaluation des marchés nationaux, Européens et internationaux sur la base d'aspects économiques, sociaux et environnementaux analysés pour mettre en exergue quelles sont les biotechnologies déjà mises sur pied ces dernières années et comprendre quelles sont les possibles applications futures dans le secteur des biotechnologies de surcroît, les chances de développement des biotechnologies au niveau régional seront prises en compte.