

Bioeconomy and Green Economy: From Theory to Practice. Case Study of a Tuscan Micro-Enterprise

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Abstract

Bioeconomy research focuses on development process to realize through energy and production efficiency, by reducing polluting activities, using renewable resources such as biomass, wind, solar, hydro and recycling of all types of waste, even within the limits defined by the market economy. This paper aims at describing activities and projects of Rohan Italia srl, a micro-enterprise in Livorno, Tuscany – Italy whose policies are developed according to bioeconomic theories. Rohan Italia srl is a leading pharmaceutical company in the production of vegetable based medicine and their by-products. Rohan Italia policy is deeply based on the implementation of traceability process which is kept under control by an integrated Quality - Ethics - Food Safety management system, based on international standards. This system supports Rohan's mission which fosters the use sustainable technologies, the protection of biodiversity and the involvement of new employers in social responsibility policies. At the same time, the company ethical mission is promoted to all the stakeholders and representatives of the local organizations it collaborates with. Rohan is involved in two projects: 1) "Island of Gorgona": the inmates of the high security prison in the island are involved in planting, growing and harvesting native plants; 2) "Forest of Montenero": social workers ("protected categories") are involved in the maintenance and promotion of woods in the park of Montenero. This project aims at developing a socio-rural economy, based on the involvement of unemployed people with mild disabilities and on the recycling of wood waste as biomass to fuel the supply chains.

Keywords: bioeconomy, green economy, sustainable economic development, ecological economics

1. Introduction

Defining the bioeconomy is still a work in progress and, despite the significant contributions given by Georgescu-Roegen to this branch of economics as a discipline, it has to be seen today, more than ever, not simply as an economic framework to set the concept of sustainable development in, but as a *summa* of the basic principles of an economy compatible with the law of nature (Georgescu-Roegen, 2003).

The research in the field of the green economy, which is an economic model that originates from studies on the environmental impact of the production process and the transformation cycle (Venkatachalam, 2007), might be complementary. This research focuses on the development to realize by improving energy and production efficiency, by reducing polluting activities, by using renewable resources such as biomass, wind, solar, hydro and by recycling of all types of waste, even within the limits of the market economy (Spash 1999). Through the methods of analysis suggested by these disciplines emerges that environmental damage affects the traditional measure of well-being, that is the GDP. Some activities that are part of it, the ones which derive benefit from the quality of the environment, have a negative outcome because of the impact of other economic activities that waste non-renewable resources.

The concept of green economy, apart from ideological radical positions, starts developing from the Stern Review (2006) that suggests carrying out an economic analysis of the impact and of the environmental changes induced by production activities, by highlighting the negative effect these factors have on the GDP (Stern, 2007). The green economy is to be interpreted as a new model of development, based on the dogmas of the bioeconomy – which shows the link between ecosystem net balance and social well-being (Common, Stagl, 2005) – rather than on oil and fossil fuels. The structure of this paper develops around two sections and three sub-sections. In section 2, after a brief discussion about the economic theory of reference, we shall introduce the central themes of bioeconomy, with specific reference to the European Union position. In Section 3, we shall analyze a case study according to the following scheme: economic analysis of the province of Livorno – Tuscany, Italy – (section 3.1); description of the Rohan Italia Srl (section 3.2); description of the projects “Island of Gorgona” and “Forest of Montenero” (section 3.3).

2. The Economic Aspects

Historically, the environment is the object of study of economics from different point of views. The classics, such as Smith, Ricardo, Malthus, had already grasped the concept of limits: not only are natural resources scarce, but also available in quantities that cannot be changed. There is a limit that cannot be exceeded and that requires the conservation of this heritage. In particular, Malthus points out that the amount of land is fixed, that cannot be changed, that is irreplaceable and non-renewable. Therefore, once all the lands is put to use, it is not possible to increase agricultural production: in the absence of food resources, population growth tends to curb and to stabilize around a level close to sustainability.

Ricardo, without stressing the absolute scarcity of land, notes that not all the lands have the same capacity: initially, the most fertile ones will be exploited; then, even lands with a lower production yield will be cultivated. The diminishing returns of agricultural production will not fully satisfy the demand, which will slow population growth. Marx refers to the concept of absolute limit with regard to natural resources, to interpret it according to the society class schema. According to Marx, science must transform the value of the environment in a use-value for the individual: nature must become something useful and usable. Marx justifies the class conflict by assuming as a starting point, the scarcity of natural resources. For this reasons, he states that pollution, which is one of the major negative externalities of our century, represents an expense that weights on the poorest social classes, who cope with the most polluted living and working conditions.

Workers and citizens suffer industrial pollution because industry has no interest, on its own, to develop more expensive but less polluting production systems. Mill introduces the concept of progress as an instrument to overcome the limit of the scarcity of resources by anticipating the vision of unlimited growth expressed by the twentieth century economists. Technological progress allows to increase natural resources efficiency: in other words, what classics refer to is a “mobile” limit which can be moved forward thanks to technological progress.

Due to the rise of neo-classical setting, the classical pessimistic view is abandoned, almost entirely: it neglects attention to the environment and resources, in the belief that progress is a never-ending process. The studies on the Pareto optimum seem to follow this theory by stating that any economic system tends to balance spontaneously. Market finds the best allocation of resources, and government intervention should be limited, or even eliminated, not to hinder market forces. These studies pay particular attention to the short term conditions, ignore the pessimistic considerations of classical studies and do not take into account any evaluation of long-term effects of human action. The twentieth century, when the theory in question is stated, will be remembered as the century characterized by the most serious environmental destruction, determined by the extreme humanization of the environment itself (Söderbaum, 1992).

This view must not appear superficial from the historical point of view: the period of reference seems to be rich in ideas that pessimism tries to suffocate. Today, world's population has raised so significantly that it has brought out the real scarcity of some resources, such as oil, energy, water. The only way to improve considerably the impact that production has on the environment is to change the involved technologies. It is urgent to research and invest in technologies that do not lead to conflicts between economic productivity and environmental impact. (Commoner, 1995)

An economy based on the principle of the responsible use of natural resources can be the leading force to the creation of new jobs, retraining and re-integration – into the path of productive development – of rural, coastal or traditional industrial areas marked by the crisis. Supporting a process of maintaining and strengthening those natural resources could be a source of development for the future generations. European policy is aimed at: a) promoting an economy with limited impact on soil and environmental resources; b) balancing the need for long-term sustainability of the use of biological resources for productive purposes; c) protecting biodiversity and environment. «*Biodiversity in all its dimensions -the quality, quantity and diversity of ecosystems - needs to be preserved, not only for social, ethical or religious reasons, but also for the economic benefits that it provides to the current generation and future. We must strive to become a company that recognizes, measures, rules and guards in a responsible manner this natural capital*» (TEEB Study 2010).

The Millennium Ecosystem Assessment distinguishes four categories of ecosystem services:

- provisioning services, which provide food, timber, fibre, fuel and other raw materials;
- regulating services, which regulate the quality of air and water, soil formation, waste treatment, by regulating natural hazards such as erosion and infestation;
- cultural services, including intangible benefits, such as cultural identity, intellectual improvement and knowledge;
- supporting services, involving the creation of habitats and the conservation of genetic biodiversity;
- Since the goods and ecosystem services have always been available and never been traded in a market, their real value is underestimated, even by policy makers (Costanza 2002).

The Convention on Biological Diversity in Rio de Janeiro in 1992 states that each party have to develop strategies and action plans to conserve and promote a sustainable use of biological diversity. In this sense, in addition to policy statements, it would be of paramount importance a kind of widespread intervention that emphasizes the relevance of biodiversity in the management of economic and social initiatives.

It does not mean abandoning the technological progress that enriched past generations, but rather redirecting research to develop innovations and manufacturing processes according to the principles of the bioeconomy, penetrating new markets, experiencing new techniques and starting a close collaboration between institutions and social partners.

Geoghegan-Quinn, EU Commissioner for Research and Innovation, states that «*Europe is now ready to shift to a post-petroleum society, one in which we use our natural resources more sustainably and smartly. To achieve this result, the strategy includes investment in research, innovation and skills, protection of the environment, energy and food security and the development of markets and competitiveness of Europe*» (EC, 2012).

In addition, the acceptance of the bioeconomy principles does not mean interrupting the production, but fostering the production according to new methods that could guarantee the preservation of the environmental resources. On the one hand, the OECD has a very busy schedule to support biotechnology because it may play a prominent role in the development of a global bioeconomy (Lehtonen 2009).

On the other hand, the European Commission considers bioeconomy as the new paradigm to develop the food sector, to manage resources sustainably and to reduce gradually the dependence on non-renewable resources. The European perspective on bioeconomy pervades the political decisions about the increase of investment in knowledge and innovation, with anticipation of a participatory governance based on a constant dialogue with society.

At the end of 2011, the Commission suggests a 80 billion euros program called Horizon 2020, which provides research and innovation with investments, in particular for SMEs. The program specifies that a new approach to research and innovation is required according to a new economic scenario.

Competitiveness rhymes with sustainability: it is no accident that most of the appropriations concerns study and identification of technical ways to solve problems connected to food security and sustainable agriculture. In February 2013, European Commission set up an observatory to monitor progress and evaluate the impact of the development of the bioeconomy across the European Union. The observatory will collect data to follow the evolution of the markets and monitor the policies (European, national and regional), as part of research and innovation, as well as assess the adequacy of public and private investment in the sector.

In the economic post-petroleum era, a coordinated development of policies to manage the environmental resources is required, especially in terms of current and future competitiveness of European countries. The European institutions assess the value of the bioeconomy sectors in Europe around 2000 billion euros: it is a macro-area that should not be underestimated and that might create 22 million jobs by 2025.

Bioeconomy, and the use of its principles to manage land and production units, may be the answer to the dependence on fossil fuels and, in the long run, the new economic model where to set the achievement of food security, the reduction of environmental impact, the waste recycling, the proper use of resources, with a relevant growth of job opportunities. This approach is not only academic, but new production paradigms might affect the economy and society all around the world.

As clearly shown in the report Union Camere Green Italy 2011, due to the economic crisis, recently the attention to the mechanisms of environmental protection has increased because these mechanisms should represent one aspect of a broader strategy to manage land and to foster development.

The environment is, and should be perceived as, a factor of economic growth, which cannot be destroyed and depleted according to the same long-term competitiveness promoted by the economic system. Bioeconomy is not only a theory, as the study case we are going to introduce shows. It represents a virtuous micro-reality in an area characterised by poor development and high de-industrialization, like the Leghornese area.

3. Case Study: Rohan Italia Srl

We are going to present the productive activity of a micro-enterprise, Rohan Italia Srl, called Rohan in this document and set in the province of Livorno.

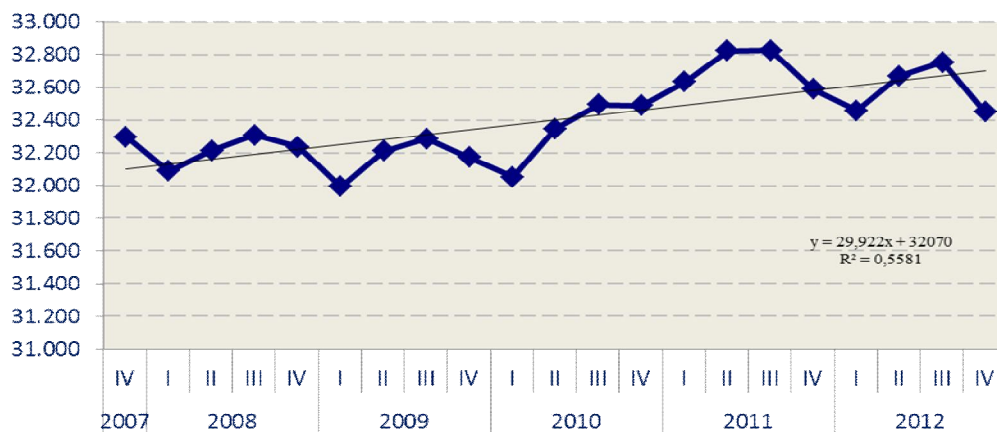
3.1 The Province of Livorno

In order to better depict the economic, social and productive framework of the project, we will analyze briefly the Province of Livorno according to the major yardsticks of growth and development.

As the traditional economy has not found a metric system to measure the welfare yet, it is common to start from economic data and then highlight the different social and environmental aspects.

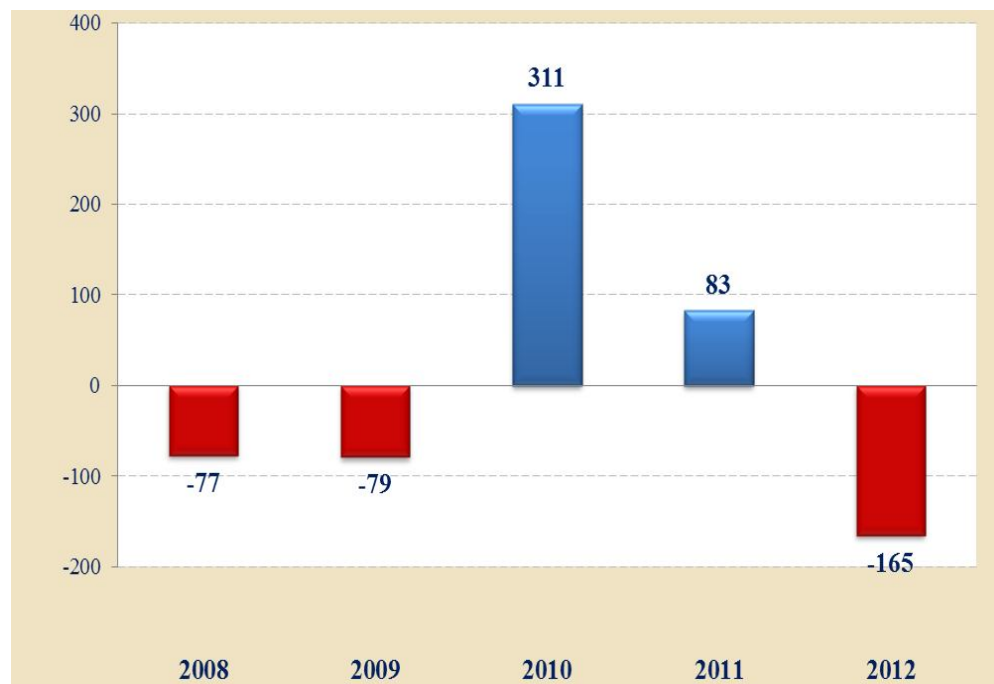
The first aspect that we can check is the number of companies registered in the province of Livorno: this element, besides the other ones showed later, gives a clear idea about the dynamism of the area where the company is set.

Figure 1: Number of companies registered in the province of Livorno (Livorno Chamber of Commerce, 2013)



The graph shows that the province of Livorno has responded well to the economic crisis that has persisted since 2008, bringing a fairly sustained growth trend. The approximation appears not perfect because of the value of R^2 , but this is due to a presence of peaks important more than to the trend, which is a growth trend, however. The approximation is not good, because in 2012 there are rising peaks that are lower than in 2011, as proof that the crisis of 2011 hit hard the Leghornese economy. It is easy to demonstrate what we said thanks to the annual balances terminations-registration in the Business Register. As a matter of fact, in the Leghornese area the 2008 crisis was going to be overcome, but in 2012 a negative trend re-emerged, leading to a deficit larger than in 2008-2009.

Figure 2: Balance terminations-registration in the business register (Livorno Chamber of Commerce, 2013)



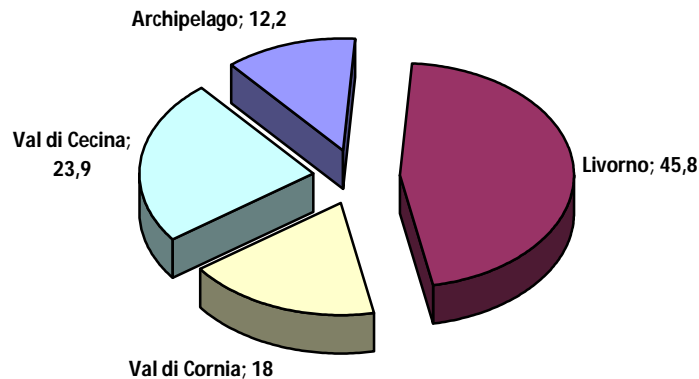
The negative situation of the province of Livorno is more serious than the situation of Tuscany, and in general of Italy. It is clear reading the figures about the propensity to entrepreneurship explained in Figure 6. From the table below it is possible to detect the rate of growth of companies in the Province of Livorno.

Table 1: Birth and mortality rate companies (Livorno Chamber of Commerce, 2013)

Territory	Year	Birth rate	Mortality rate	Growth rate
Livorno	2012	7,03	7,14	-0,12
	2011	7,57	6,08	1,49
Tuscany	2012	6,78	6,41	0,37
	2011	6,92	5,87	1,05
ITALY	2012	6,28	5,97	0,31
	2011	6,41	5,58	0,82

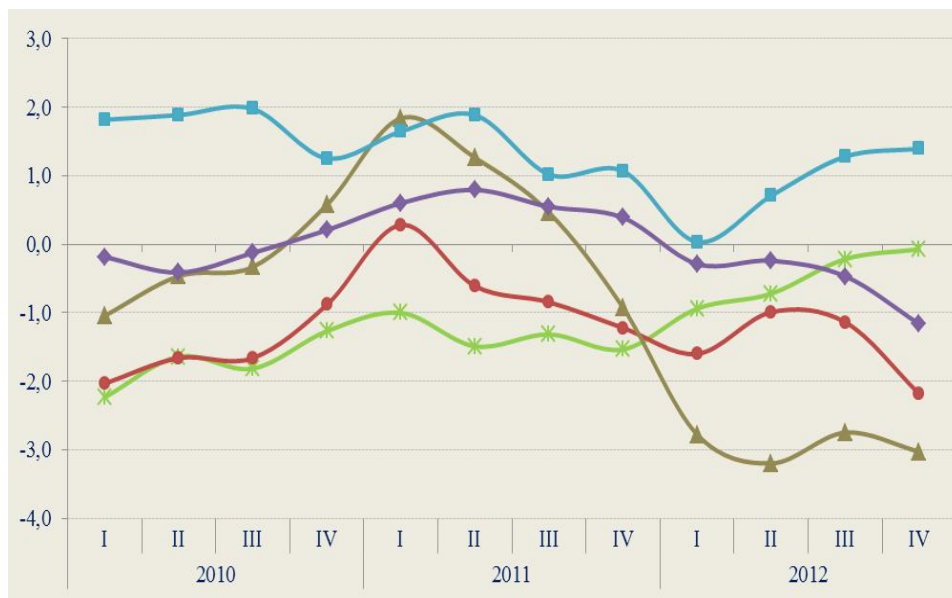
The higher concentration of companies is in the Province of Livorno, where the company object of our study is set. Thanks to projects that will be present in a detailed way later, the company extends its production in economically depressed territory: the Island of Gorgona and the Forest of Montenero. The distribution of companies in the province of Livorno is well-represented by the pie chart below. It is from the division of the province that Livorno Chamber of Commerce did.

Figure 3: Distribution of active companies by 2012 the province of Livorno (Livorno Chamber of Commerce, 2013)



In order to conform to the principles of sustainable development and bioeconomy, as well as to promote the area, some projects of Rohan concern the agricultural sector as well, even though it is marginal in the province of Livorno. However, the data show that the sector is growing and that the change of production models – applied to traditional industries and by taking into account the peculiarities of the area – might be a way to fight the economic crisis and find new productive and competitive areas, in accordance with green economy. Another area of interest of the company is food production (especially herbal preparations and food supplements). As it is showed in the detailed description of the company, it is not production of food but more precisely production of phitoterapeutic products. In the province of Livorno, this market sector has had the highest recession due to the economic crisis.

Figure 4: Performance economic sectors in the province of Livorno (Livorno Chamber of Commerce, 2013)



Legend: green – agriculture and fishing; red – manufacturing sector; brown – building sector; purple – trade; light blue – accommodation and food services

The problems in the manufacturing sector are clearly shown in the following tables

Table 2: Manufacturing Sector average trend variations of the first three quarters of 2012 (Livorno Chamber of Commerce, 2013)

Production	-9.8%
Turnover	-11%
Domestic orders	-11.6%
Foreign Orders	+7.5%
Degree of utilization of production plants	70.7%
Occupation	-0.1% economic
Producer prices up	+8.1%
Turnover abroad	+0.02%

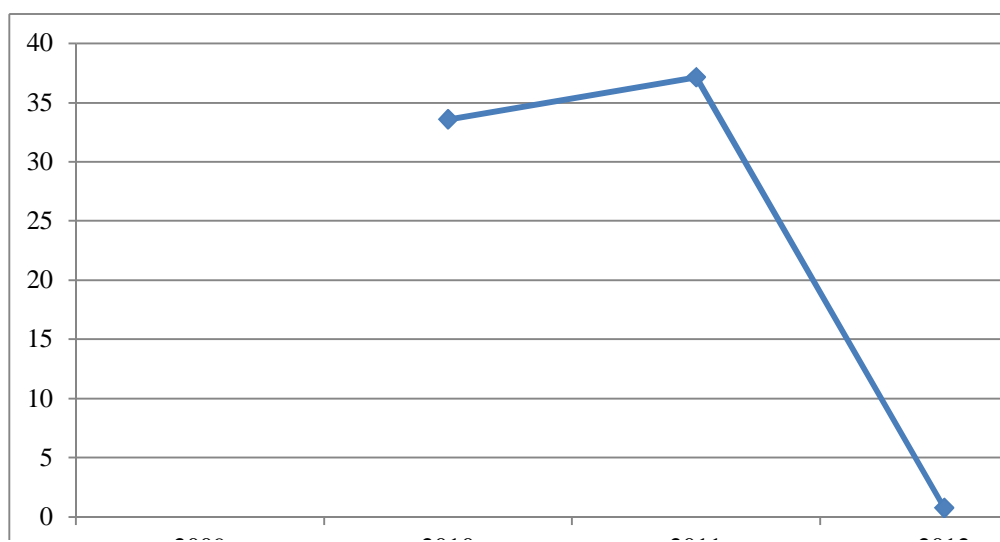
The industry crisis is even worse in the last quarter of 2012, as shown in the table

Table 3: Manufacturing Sector average trend changes during last quarter of 2012 (Livorno Chamber of Commerce, 2013)

Production	-10.4%
Turnover	-11.5%
Domestic orders	-11%
Foreign Orders	+1.7%
Degree of utilization of production plants	64.6%
Occupation	-0.4% economic
Producer prices up	-2.6%
Days of guaranteed production	107

What has been said up to now can be comforting only according to the percentage of exports of food industry, which increases of 3.6% (Livorno Chamber of Commerce, 2013) between the first half of 2011 and the first half of 2012. This fact supports the theory according to which crisis may be faced thanks to innovation and eco-sustainability. As a matter of fact, Rohan has maintained a positive growth trend, with a strong stop only in 2012 but in any case a better trend than the average of the province of Livorno. The data shown in the graph below concern the years from 2009 onwards because, from 2007 to 2009 the company had to suspend the production due to lack of basic infrastructure. The studied trend refers to the taxable income, net of the costs of R & D (relevant cost for innovative companies like Rohan).

Figure 5: Rohan growth rate of taxable income from 2009 to 2012



Areas where activities of Rohan are developed have a high percentage of unemployment: data must be analyzed carefully, because of the difficulty in finding actual information in macroeconomic terms (Blanchard, Giavazzi and Amighini 2012).

The productive structure created in the Island of Gorgona, has as workers individuals that cannot be defined as "unemployed", as it is held in the prison located on the island. This element of considerable social and economic impact, is little relevant according to the traditional tools of economic survey from the precise reading of charts and tables.

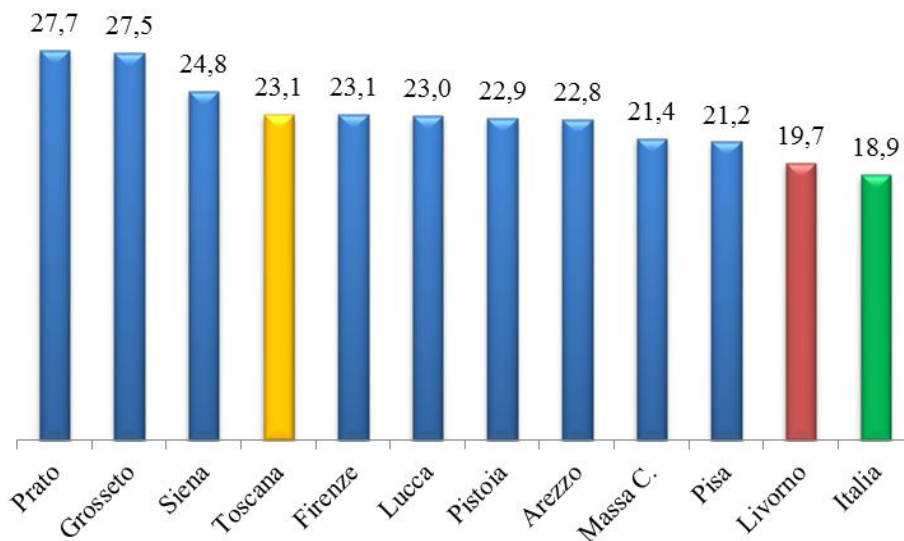
Table 4: Percentage of registered unemployed on the residents, updated to 31/05/2012 (Livorno Chamber of Commerce, 2013)

Archipelago	21,24%
Val di Cecina	13,44%
Livorno Area	12,92%
Val di Cornia	12,77%
Average of the province of Livorno	13,80%

In addition it is also interesting to investigate the change in the rate of entrepreneurship in the province of Livorno: the trend of this rate provides a basis for the socio-economic and occupational development. In addition, with high rates of entrepreneurship, positive externalities are determined (van den Bergh, 2010), as it is easier to set up a kind of open laboratory of Research & Development, as well as to provide the market with new ideas. The presence in the territory of "innovative entrepreneurs" provides a strong impetus to economic development and possible imitation of such procedures. By studying the case of the Rohan, it is clear that the projects that have been undertaken over time are consistent with the definition of "innovative entrepreneur", as we shall see later. (Schumpeter 1993)

The rate of entrepreneurship of the province of Livorno, appears below the other provinces of Tuscany. All the more reason to demonstrate how companies like Rohan, that are interested in and encourage a system of research and development aimed at eco-sustainability, go beyond trends of their territory. In any case, the chart below shows that the provinces of Tuscany are better than the Italian national average (Study and Research Centre, Livorno Chamber of Commerce 2013)

Figure 6: Rates of entrepreneurship 15-64. Provinces of Tuscany and the Italian average (Study and Research Centre, Livorno Chamber of Commerce , 2013)



We are now going to analyze in detail the two areas that are affected by Rohan new projects.

The Island of Gorgona - managed by the Tuscan Archipelago National Park, is now home of a penal colony and has no relevant production activities.

The Island of Gorgona is considered an economically depressed area, as underlined by the DDL 470 brought up for discussion in 2001. (Typography Senate 2001)

«The bill would foster the Home Office to establish a functional list of smaller Italian islands, together with specific data for each island, as well as to establish a special office to set up in its field that by means of a computerized database, will update and publish the data contained in the List itself.»(Typography Senate 2001). The bill stresses the importance of the areas of interest in the project under consideration: «a) the development of agriculture fishing, mariculture and the conservation and processing of fish and agriculture products, shipbuilding, viticulture, tourism and scientific research» (Typography Senate 2001).

The last element, as we shall see later, it is perfectly consistent with the type of research project undertaken by the studied company.

In addition, in order to promote the intervention in the Italian Minor Islands, (the Island of Gorgona belongs to that category), it is possible to see other documents which underline an urgent need for new development, respecting and protecting the environment.

Decree of the President of the Council of Ministers of 7 March 2003 – *Identify type and sectors of intervention allowed having access to the fund for the protection and for the socio-economic development of the smaller islands*. Among the selected projects, there are those ones that refer to the environmental protection and development of the country (OJ n. 97 2003).

In addition, the Law 28 December 2001, n. 448. *Provisions for the preparation of the state annual and multi-year budget*, art. 25, paragraph 7, states that «to urgently adopt measures to protect the environment and to foster the socio-economic development of the smaller islands – identified between the many areas listed in Annex A, attached to this bill – the Ministry of Economy and finances establishes the Fund for the protection and the socio-economic development of the smaller islands.»(Official Journal no. 301 2001).

The issues related to the "Islands" is also particularly felt by the European Union, which sees the difficulty of farming systems in those territories and the loss of competitiveness of these areas as an emergency to deal with. (G. U. EU 181/7 2012)

The Forest of Montenero, managed by Parco dei Monti Livornesi, is a protected area subjected to environmental and landscape commitments that hardly match many kinds of productive activities. The project of Rohan is fully integrated with the rules of the Park and creates productive activities where, for reasons of safeguarding, there can be no productive activity.

Another element that needs to be clarified before going on with the explanation of the case is that the municipality of Livorno is involved in sustainable development, through the implementation of Agenda 21, which provides for the participation of local organizations, private companies and citizens to a comparison on sustainable development. In 1999, Livorno municipality joined the Aalborg Charter and in 2011 it joined the campaign promoted by ICLEI. In addition, in 2003 the city council of Livorno joined the campaign "Friends of forests" sponsored by Green Peace. For this event, the municipality tried to achieve the following objectives (Municipality of Livorno):

- use recycled products and promotion of separate collection of rubbish;
- choose invitations to tender for the purchase of FSC-certified wood products;
- reject timber from destruction of primary forests;
- raise public awareness on issues related to environmental certification and recycling.

3.2 Rohan Srl Company

It is of paramount importance to highlight that the productive reality we shall present is radically different from the other ones in the same area. This is due to the fact that production follows the basic principle of bioeconomy and to a strong entrepreneurial inclination to innovation and research. This implies, as a matter of fact, that the results have to be evaluated in a long-term perspective and that many of these are difficult to measure according to the traditional monitoring parameters, such as sales, revenues and investments.

Rohan is mainly engaged in manufacturing and marketing products connected to the healthcare sector, such as cosmetics and herbal extracts of medicinal plants, supplements, health drinks, syrups, capsules, tablets, sachets, soaps natural and organic cosmetics. It is officially considered a food production company (according to Livorno Chamber of Commerce Register).

Food products include:

- CARDIO-3 line: supplements for cardiovascular health based on fish oil (3 Pure Cardio-Scandinavian) or olive leaves (3 Cardio-Aktiv);
- health drinks birch and spruce sap based;
- food supplements and syrups which recall the Scandinavian tradition and exploit the properties of medicinal herbs such as *Rhodiola Rosea L*, *Schisandra Chinensis*, *Elethreococcus* or *Echinacea Purpurea*.

At the same time Rohan, under the brand VILLA TOSCANA, offers a line of certified organic skincare products, prepared according to German BDIH standards which show the way Rohan is linked to the territory and to Tuscan flora and the way it exploits the properties of Rose Hips, Iris Fiorentino, and olive tree. Among these products, customers can find nutrients and moisturizers for face and body, hand creams and creams for children.

Rohan is set in the industrial area of Livorno, its majority shareholder and also “innovative entrepreneur” is Dario Nadimi Zahedani. The company was founded in 1998, firstly as Sas and then from 2002 as Srl. Rohan, which is a micro-enterprise set in the industrial area of Livorno, arises from the entrepreneurial concept of its main shareholder, whose interest in food – in particular the natural and organic one – directs towards high quality products to market and produce, according to herbal traditions of local and foreign cultures, especially the countries of Northern Europe.

Thanks to the experience in the trade of its entrepreneur, who spent many years in the Scandinavian countries, where the use of herbal products is strongly established, in 1999 Rohan is one of the first companies to distribute exclusively on the Italian territory a Swedish Omega-3 based product. It is a natural product based on essential fatty acids derived from fish oil, now widely known to the general public for its preventive properties against cardio-vascular risk and in favour of the reduction of blood cholesterol and triglycerides levels.

In the meantime, the company research and development department directs the business activities towards the production of its preparations according to principles of quality. On the one hand, they choose materials, whose origin are carefully controlled, and prefer the ones which have an organic and sustainable origin; on the other hand, they select and monitor suppliers and processing methods.

Rohan’s productive policy directs towards natural specialities based on phytoterapeutic essences (“uncommon” on the Italian market), founded on traditions of typical use and preparation. These specialities help the body to contrast the onset of many diseases, such as the cardiovascular, hypertension, kidney or respiratory ones. These products have a great commercial success but, as they address consumers’ health and belong to the “health food products” category, they need more than ever strict and systematic productive approaches, designed to ensure safety and quality.

Furthermore, in order to broaden its offer, Rohan undertakes research on organic cosmetics, made with natural essences of indigenous cultivation that should realize productively in the following years. From this moment on, a strong integration with the local production has raised and the entrepreneur has implemented various projects, such as the “Forest of Montenero” project and the “Island of Gorgona” project.

For this purpose, over the years, Rohan has made substantial investments in structural terms and in machinery – in order to get a high level of automation in the packaging process – and has obtained the authorization to produce food, food supplements and organic cosmetics according to the German BDIH quality certification. In 2006, in order to achieve its objectives, the company bought a parcel in the industrial area of Livorno called “Picchianti”, where it begins the construction of a new plant – about 2000 m² – according to the safety regulations and to HACCP, which the company adapts to, by preparing a Self Monitoring Plan.

The activity, however, meets an obstacle during the development of the new plant, due to the non-realization of infrastructure services by the municipality. In 2007, 2008 and part of 2009, it is forced to stop production and the ministerial authorization is suspended, with disastrous consequences in terms of huge drop in sales, of higher cost of production (provisionally entrusted to third parties) and of financial charges on investments. In order to react to the accident, Rohan, in concert with a company interested in construction works in the same area, burdens with setting up infrastructural facilities such as electricity, gas and especially water – which is an essential element within its cycles. Water, as a matter of fact, is used to wash the raw materials consisting of vegetable crops. In September 2009, the new plant is operative, production can start again, according to the ministerial authorisation, and the industrial area receives an important contribution from the real estate point of view.

Despite the damage, which results in not generous budgetary terms in 2007 and in an operating loss in 2008 and 2009, the company is still basically sound and responsive and, since 2008, it has carried out research projects, by establishing institutional collaborations with university research centres, such as the Department of Pharmaceutical Sciences, University of Florence. These initiatives result in new products directed towards cardiovascular prevention and health and new organic cosmetics of high quality (under the brand “Villa Toscana”) characterized by a strong relationship with the land and the typical local flora. In the third quarter of 2009, they are placed on the market, nationally and internationally, with a positive outlook for the following year. To support this perspective, the fact that the commercial trend of health food and dietary supplements sector, is positively in contrast to the negative trend that “traditional” sectors are experiencing, especially in the light of the global economic crisis.

To give a new push to the activity, new commercial initiatives are organised: the opening of an outlet inside the factory, at the end of 2010, the online sales of products and the establishment of supply relationships with some national supermarket retail chains. The company inborn propensity to the principles of quality and sustainability, as well as its awareness of the benefits from the adoption of a voluntary integrated management system based on international standards, allow it to gain both in terms of a positive impact on corporate stakeholders and of a strategic tool designed to improve the qualitative performance of the company. The main reference of the company management is ISO 9001:2008 standard, which is added to a) the Self Monitor Plan, b) a system of food safety management (updated to market products in supermarket retail chains, both national and international) according to the BRC standard, c) a system to manage corporate social responsibility according to SA8000.

In the next future, Rohan aims to integrate this system of management with environmental procedures and policies according to ISO 1400 standard by exploiting data from the Ethics and Social balance sheet that the company is arranging in order to stress once more its ethical objectives.

3.3 The “Island of Gorgona” and the “Forest of Montenero” projects

The Island of Gorgona, managed by Parco Nazionale Arcipelago Toscano, is now home of a penal colony.

In collaboration with the authority of the Park, the Province of Livorno, the administration of the prison and the University of Florence and PIN-Prato, a new cultivation of herbal species, which have been traced by Rohan for the productions of raw materials, has been implemented. This project implies the creation of an agroforestry activity and encourages the requalification of human capital: as a matter of fact, the workers involved in the project are exclusively inmates. On the one hand, using the work of these people, who do not belong to any typical category of the labour force, represents an alternative way to the traditional ones to take care of the territory and of the subjects that live on it. On the other hand, inmates get new competence and have an opportunity to social recovery.

Inmates have the opportunity to acquire new professional skills and a salary that will be supportive at the time of the end of the sentence and reintegration. According to art.21, inmates can work either in Montenero or at Rohan, even during the final part of the sentence. From the social point of view, the more relevant aspect is the reduction of recidivism that is statistically very significant in the individuals who, after the term of imprisonment, go back into society with a chance of decent work. From a practical point of view, besides creating a human capital, this project aims at an economic development of the island, in accordance with environmental and sustainable development. In the light of we have described above, we can say to be in front of a business innovator, at least according to what Schumpeter stated on innovation.

On the Island of Gorgona there is the spontaneous growth of some herbal species, typical of the Mediterranean scrub, such as mastic, myrtle, arbutus and protected species such as the *Helichrysum*. The project is not limited to wild-growing species, but integrates them with dedicated crops of other species such as *Artemisia*. The above mentioned species are the basis of Rohan production.

This project aims at protecting the genetic resources of species typical of the Mediterranean scrub, by enhancing their potential in order to use them in different productive sectors and to foster the development of innovative products in the fields of food supplements, phytotherapy and cosmetics. This approach aspires to identify strategies to foster a sustainable development in the island, through the conscious use and enhancement of environmental resources, assuming a coordinated management of all activities and processes that directly or indirectly affect the environment.

In order to implement what has been described, a Life Cycle Assessment study for the implementation of Environmental Management Systems (EMS) will be carried out. The previously mentioned tools should allow a gradual and long-lasting improvement of environmental quality, not divided from the development of compatible productive activities. These objectives will be achieved by integrating scientific competences in the genetic, agronomic, analytical, bio-pharmacological and phytochemical fields, through coordinated scientific research.

The study will also verify the existence of any correlation between the measured values and the economic activities carried out on the island, in order to develop alternative development frameworks, taking into account the influence of the same frameworks on the species of interest to the project.

According to the undertaken study and to its application to the practical case of Rohan on the Island of Gorgona, a high degree of interdisciplinarity is required, due to the large number of variables to study, from the most technical study of the species in nature to the economic ones, up to the sociological aspects related to the use of prisoners as labour force. Obviously, what is in the research must keep anchored to the needs of sustainable economic development, according to the environment of reference. As for the technical part, it will enable the achievement of results transferable to the application field and provide a useful source of information to develop productivity sectors of Tuscany.

At the same time, the acquisition of scientific knowledge in the fields of vegetal biodiversity, of phyto- and bio-pharmacology, as well as the acquisition of methods to implement EMS, will be a useful tool to validate the established practices and to identify innovative uses in many economic sectors, from food and ornamental plants, to herbal and health, providing a scientific basis to reevaluate traditional uses.

From a technical point of view, more specific innovative elements concern:

- a more precise characterization of the species typical of the spontaneous Mediterranean flora, at an intraspecific level as well, aimed at the acquisition of information on a level of genetic diversity within natural populations, through the application of molecular markers;
- the presence of antioxidant compounds and the study of their effects at a cellular level and on integrated preparation of the cardiovascular system, may lead to important contributions to protect human health, even by considering the duality of antioxidants.
- the identification of potential antimicrobial properties that vegetable extracts have, together with the study of the mechanisms of action of the isolated compounds, may respond to the increasingly pressing request of new active principles, especially in comparison with those that might express an innovative action.

In conclusion, the proposed investigations may provide the basis to obtain new herbal products and high biological power extracts to be used as active principles in therapy, as pharmacological means of investigation or as models to develop new drugs. Screening biologically active molecules can make available new vegetal compounds to be used as preservatives and / or food supplements, as well as in the cosmetics sector.

On the island the cultivation of medicinal and aromatic plants, and their processing, up to the extraction of the essential oils, will be carried out locally and their vegetal waste will be used as vegetal compost and as animal feed (goats in particular). In this way, it will be possible to use 100% of the plants. This is an important aspect because it expects to move concentrated products from the island, without burdening with pollution and energy consumption the delicate balance of the island. The whole production process will be carried out in the Rohan plant in Livorno.

The company is already working on a number of products to offered to the national retail and abroad (Germany) that have the characteristics of traceability (from the Island of Gorgona), a high natural value (organic certifications) and social value (reduction of recidivism).

Forest of Montenero, managed by Parco dei Monti Livornesi. In collaboration with the local authorities, with the University of Florence and with PIN-Prato, a plan to redevelop the "Forest" has been put in place. The maintenance of the park, especially the pruning of plants, is carried out in safety conditions, by socially useful workers belonging to protected categories. In this way, an embryo of rural economy, which was absent on the territory, can develop with the possibility of employing unused and / or unskilled human resources. The same waste biomass, once collected, can be valued as a secondary raw material for new productions.

Conclusion

The exploitation of agroforestry resources can provide useful means to support rural development of depressed areas. The Province of Livorno (in Tuscany, Italy) is classified by EU as an economically depressed area due to structural difficulties and low employment.

This paper aims at analysing a case study of an enterprise involved into two projects in the Province of Livorno. The Rohan Italia Srl, is a leader company in Tuscany in the production of local traditional medicinal vegetal species and products derived from them. The company's policies are deeply based on the implementation of traceability process and the integrated Quality - Ethics - Food Safety management system, based on international standards. Through this system, Rohan supports the company mission to use of sustainable technologies, protect biodiversity and train new employers in social responsibility policies. At the same time, it communicates and disseminates the company ethical mission to all the territory stakeholders, representatives of the local organizations it collaborates with.

The two project Rohan is involved in are:

- "Forest of Montenero".
- "Island of Gorgona".

This paper intends to identify and study patterns of implementation of activities with strong social and agri-environmental impacts, due to the driving role of entrepreneurial initiative. In particular, the study will focus on: 1) the impact of company technical and organizational innovation; 2) the role of local knowledge on agroforestry and sustainable productions; 3) the role of human capital in the two project rural areas; 4) the impact of ethic and sustainable business. These highlights analysis will be related to the development of projects study areas rural socio-economies.

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