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THE FISHERIES SECTOR IN ITALY IN THE FACE OF INTERNATIONAL COMPETITION AND INTERNAL STRUCTURAL PROBLEMS

JEL classification: Q22, Q27

Pasquale Lombardi*, Fabio Verneau*

Abstract. *The paper presents a critical analysis of the fisheries and aquaculture sector on the eve of a new reform anticipated by the Green Paper of 2009 and by the Commission Communication on the Reform of the Common Fishery Policy (CFP) of 2011.*

The paper uses the main statistical sources available to analyse the evolution of production and trade at worldwide, European and Italian level. The time series used covers the period from 1990 to 2009.

Particular attention is devoted to the Italian situation, evaluating the trade performance in Europe and also considering the evolution of the structural characteristics of the Italian fleet, catches

and revenues by species, categories and different systems of fisheries. With a highly fragmented structure of its production capacity and a gradual decline in catches, in recent years, the fishing industry has seen a decline of about 20% in revenues. However, the fisheries sector continues to play an important role in Italy both in the maintenance of the social fabric and in terms of the conservation and enhancement of cultural identities.

Finally, the paper develops a brief summary of legislative actions that have characterized the CFP until the recent reform proposal.

Keywords: *Fishery, CFP, International trade*

1. Introduction

The Green Paper (COM, 2009) on reform of the EU's Common Fisheries Policy (CFP) starts by expressing hopes for an ideal scenario for the medium term (2020) in which the fish market is booming once again, excessive and indiscriminate exploitation of fish stocks is a thing of the past, the fishing industry has finally reached stand-alone financial solidity, and industry operators are able to ensure complete transparency with regard to the traceability of the raw material "from net to plate."

The current state of affairs, however, falls far short of this, testifying to the overall failure of the 2002 reform. A combination of measures - limiting the number of fishing days, setting maximum sizes for national fishing fleets, combined with recovery of fish stock and management plans (Cosvap, 2005) - has failed to have an impact, even minimally, in correcting a scenario that has become even worse, setting off a vicious self-perpetuating circle (MiPAAF, 2007a). In fact, stock depletion generates a reduced capacity for fish reproduction from which the inevitable decline in catches follows, leading to further pressure on the marine environment arising from

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the need to compensate for the loss of economic viability of fishery (Pauly et al., 2002; Trevisan, 2003). Hence the need for further reform.

It is to be hoped, however, that events in the fisheries sector will not match those that for thirty years have characterized agriculture within the European Union. Here again, the objectives were to ensure, on the one hand, food supply at reasonable prices for consumers and, on the other, to support reasonable incomes for producers. History teaches us that mountains of public money have been spent over many decades without having provided exactly spectacular results. It needs to be said, in fact, that some measures put in place via the market have worsened territorial and social disputes and generated additional dualism and marginalization.

The fisheries situation is different and, in some respects, clearer, primarily because the product is seen much less as a “basic right” and because the issue itself is more straightforward. There is an oversized fleet that has seriously undermined the ability of fish stocks to recover to a level consistent with its rational and profitable future exploitation. Moreover, despite the crisis making its effects felt, and even affecting food consumption, the demand for fish on European markets is holding up and imports are continuing to rise, now coming to account for almost 50% of total consumption.

The policy for the sector needs to discover how to make two basic features compatible: the urgent need to recreate the raw material (reconstituting the stock) and the ability to meet market demand sustainably, which, as mentioned, may prove stable even in times of crisis (Le Gallie, 2003).

The first aim of the paper is to describe the evolution of the international scenario characterized, during the last decade, by a growth of production of more than 30% and by a profound change in the competitive scenario. The paper also attempts to outline the recent development of the European context within which the EU-15 has registered an increase of 20% in the trade deficit. Finally, in the light of the new reform proposal, the Italian situation will be analysed in more detail, leading up to some final considerations.

2. The common fisheries policy

The (now EU) Common Fisheries Policy was established with the Treaty of Rome in 1957 under Article 38. In 1972, the first, northern, enlargement of the EEC to include Great Britain, Ireland and Denmark (with very large fishing fleets) radically changed the preexisting equilibrium requiring the establishment of a common market organization capable of implementing an authentic structural policy covering fishing. The Exclusive Economic Zones (EEZ) were thus laid down, with which exclusive rights for coastal fishing were extended from 12 to 200 miles, essentially denying the member states of the Community the principle of freedom of access to the sea. Thus, the Community recognized the specific problems of fisheries, such as access to common resources, the conservation of stocks, structural policies for the trawler fleet and the complex issues of international relations arising from fishing itself.

Ten years later, EC Regulation 170/83 established the new generation Common Fisheries Policy (CFP) in a much more explicit recognition that the crucial feature of the sector is its exploitation of a renewable resource, hence trying to achieve a sort of programming for access to it and regulating the relative intensity of exploitation. The principle of relative stability introduced the problem of conservative management of fisheries resources, and in this regard, put forward management tools such as the Total Allowable Catch (TAC) and quotas.

The new policies introduced were not slow to express their overall ineffectiveness and the imbalance between the capacity of the existing fleet and the potential of the programmed catch sharpened further. Therefore EC Regulation 3760/92 was introduced to provide the new concept of “fishing effort” together with a more efficient licensing system to regulate access to fisheries as well as proposing a reduction in the EU fleet, but accompanied for the first time by structural measures to mitigate and cushion the subsequent loss of jobs in the industry.

A decade further on, none of the goals of balance and stock conservation could be said to have been achieved. Indeed, the general increase in consumption, EU enlargement and the introduction of new fishing systems raised the depletion risk for many stocks, so that by the end of 2002, further reform was adopted, which came into force on 1st January 2003, built on four pillars:

- renewal of stocks;
- reduction of the impact on marine ecosystems;
- guarantees with regard to the supply of consumer markets within the EU;
- containment of the economic losses in the industry and the simultaneous minimization of job losses.

The key element underpinning the 2003 reform is that of sustainable development and, indeed, the new CFP became an integral part of Community policies for sustainable development, putting environmental aspects on an equal footing with economic and social concerns. It was laid out in three specific regulations: EC Regulation 2371/2002 (conservation and sustainable exploitation of fisheries resources), EC Regulation 2369/2002 (structural policy in the fisheries sector) and Regulation 2370/2002 (EU emergency measures for the scrapping of fishing vessels).

In redefining the goals, the new CFP envisaged a longer term approach that referred to multi-annual recovery plans for particularly depleted fish stocks, and multiannual management plans for all the others, while seeking to address the problem of overcapacity in the fleet, which continues to represent one of the crucial aspects of the issue, the rationale used being that of redirecting aid to Community policies for sustainable development (improvement of safety conditions on board, product quality, adoption of selective fishing techniques and the equipping of fishing fleets with satellite monitoring systems) (Arnason, 2011).

Finally, among the most relevant points of the reform worth noting (which characterized the sector as a sort of supply chain) is included the direct involvement of fishermen and aquaculture sector workers in the implementation of new standards through the establishment of RACs (Regional Advisory Councils) on which local authorities, consumer organizations, representatives of science and environmental groups are also represented.

Despite its apparent regulatory and cultural ‘re-set’, the 2003 reform also failed to reach its fundamental goals, and in 2008 the Commission adopted the Green Paper on reform of the Common Fisheries Policy which, in 2011 (COM, 2011), generated a new reformed CFP package that includes:

1. a legislative proposal for basic regulation (in place of Reg. 2371/02);
2. a new legislative proposal for a market policy;
3. a communication on the external dimensions of the CFP.

The new reform package confirms the use of long-term plans, this time following an ecosystem rationale that applies the precautionary principle. It is anticipated that the long-term plans

should be ready by 2015, and based on the different types of fishing rather than on individual stocks.

The proposal also attempts to address the issue of discarding at sea species caught but not marketable¹, banning it and including an obligation to land the entire catch, allocating the non-marketable portion for purposes other than human consumption. This hypothetical rule envisages, of course, the implementation of documentation systems and very complex controls and many have already expressed their doubts with regard to the effectiveness of the rule. Another very important element of the proposal is the establishment of a system of transferable fishing quotas for large-sized fleets (vessels over 12 metres in length) with the possibility of renting or exchanging shares granted exclusively between operators within the same country, which, in the case of serious infringements would result in the revocation of the licence.

Finally, the proposal provides for specific rules in support of artisanal fleets, lines for the development of sustainable aquaculture and the further decentralization of governance.

As far as market policy is concerned, the current system, which provides for the destruction of excess fish, should be replaced by a simplified storage system for its removal and any subsequent re-marketing of fish products in order to contribute to market stabilization.

In line with the provisions of the 2003 reform, the current proposal fully adopts the principles of sustainability and should not only allow the recovery and subsequent conservation of stocks but also less dependence of the sector on public support policies. To this end, the reform proposes the adoption of the parameter MSY (Maximum Sustainable Yield) as a guiding principle to determine the maximum utilization of the resource consistent with the principle of maximum productivity, establishing that the support accorded to the aquaculture sector should be set as a priority (Cosmina et al., 2007).

3. The international framework

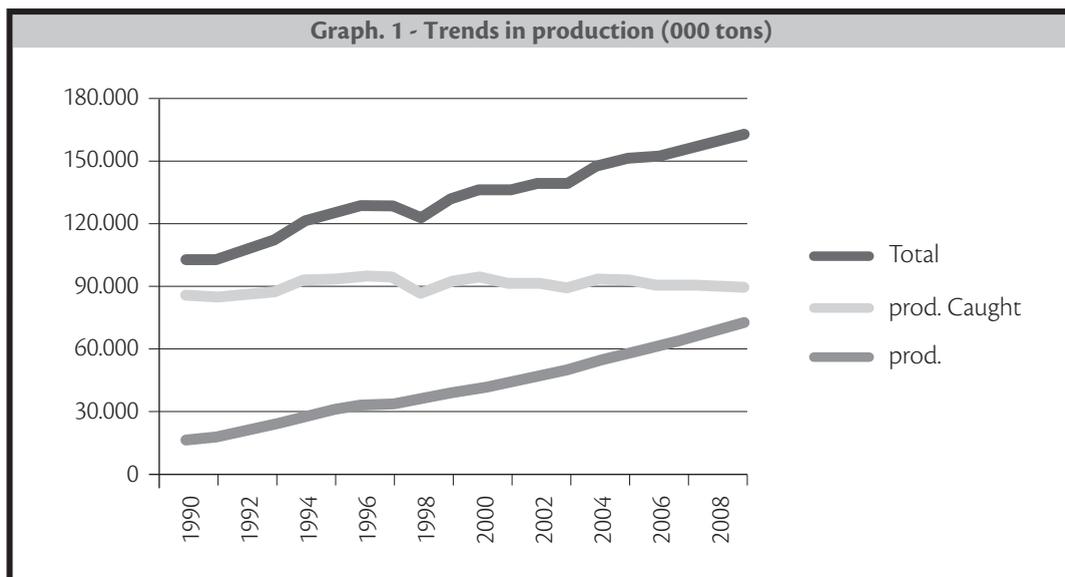
In the last two decades, world production of fish has reached almost 163 million tons, an increase of 60%. What chiefly accounts for this overall performance is “non-fished” production (i.e. farmed) which has gone from 16.8 million tons in 1990 to 73 million tons in recent years (see table 1 and graph 1).

Tab. 1 - World production of fish, 1990 -2009 (000 tons)

| | 1990 | 1994 | 1998 | 2002 | 2006 | 2009 |
|----------------------------------|-------------|-------------|-------------|-------------|-------------|-------------|
| Total world production of which: | 102.848 | 121.147 | 123.313 | 139.542 | 152.299 | 162.882 |
| Caught fish | 86.008 | 93.349 | 86.852 | 92.162 | 90.912 | 89.837 |
| Raised fish | 16.840 | 27.799 | 36.461 | 47.381 | 61.387 | 73.045 |

Source: calculated on FAO data

¹ It should be remembered in this connection that currently the percentage of discards is around 23%, and, depending on the type of fishing and the fish stocks covered by the catch, this can rise to much higher levels.



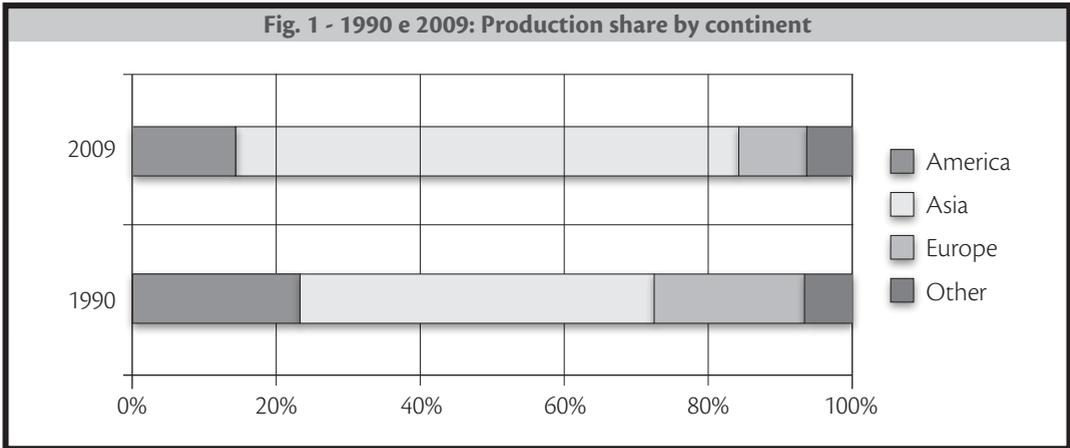
Profound and significant changes have taken place in the distribution of fish production by continent (see table 2), with Europe and America witnessing their production sharply reduced, and Asia, with over 113 million tons, showing a growth of 125%.

Tab. 2 - World production of fish by continent, 1990 -2009 (000 tons)

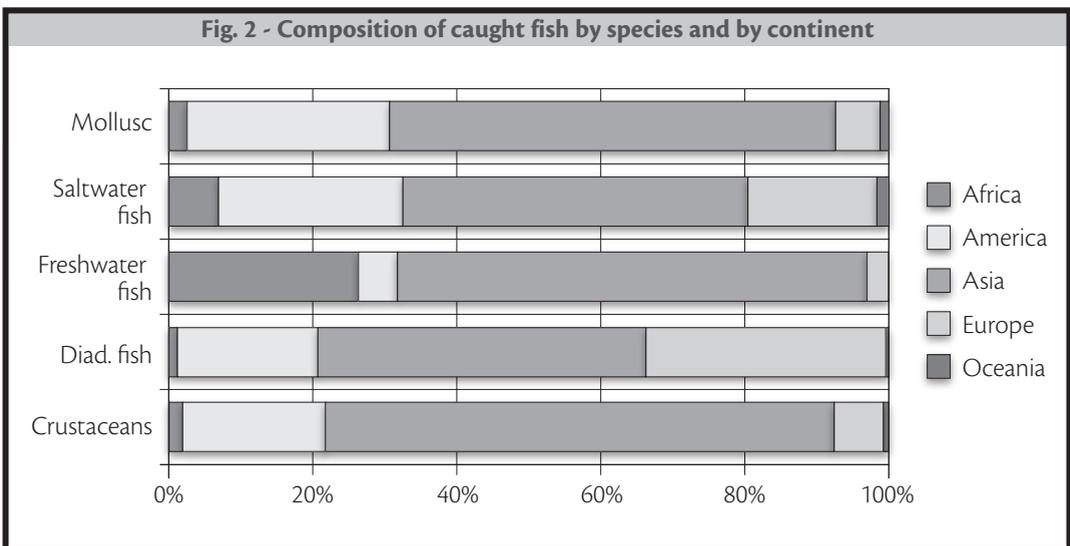
| Continent | 1990 | 1994 | 1998 | 2002 | 2006 | 2009 |
|--------------|----------------|----------------|----------------|----------------|----------------|----------------|
| America | 24.257 | 31.974 | 19.788 | 26.445 | 25.126 | 23.642 |
| Asia | 50.427 | 64.700 | 76.206 | 86.239 | 101.770 | 113.585 |
| Europe | 21.637 | 17.642 | 19.366 | 17.594 | 15.854 | 15.872 |
| Other | 6.527 | 6.832 | 7.953 | 9.265 | 9.549 | 9.782 |
| Total | 102.848 | 121.147 | 123.313 | 139.542 | 152.299 | 162.882 |

Source: calculations on FAO data

This marked divergence means that in 2009, compared to 1990, the weight of Europe and North America in the equation dropped from 45% to 25%, with Asia's share increasing from 49% to 70%, resulting in the breakdown shown in figure 1.



The leadership of the Asian continent is confirmed for any type of species caught, as shown in figure 2.

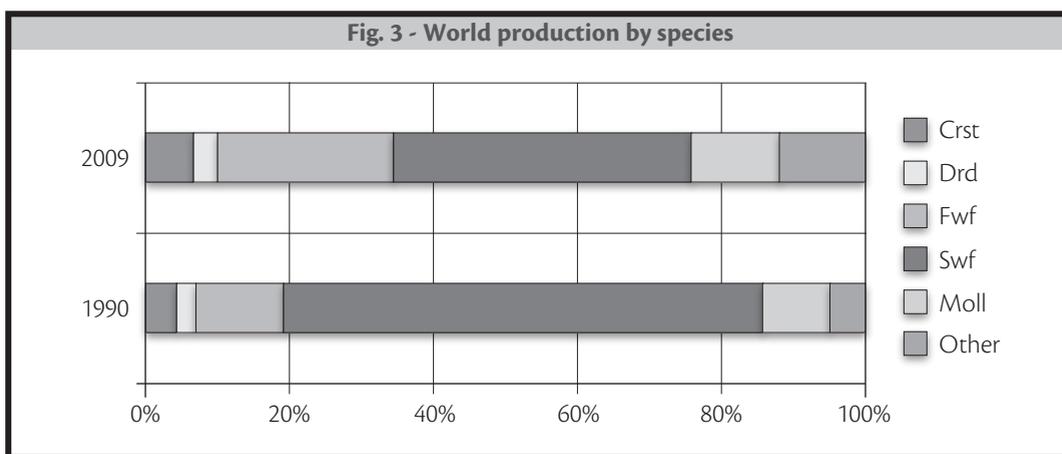


In table 3 world fish production is classified by groups of species. Marine fish make up by far the largest proportion followed by freshwater fish and shellfish. This said, whilst the group exhibits a trend that is essentially flat, all other groups of species have registered significant increases, sufficient to significantly alter the composition of the production mix, as indicated in figure 3.

Tab. 3 - World production of fish by categories of species, 1990 -2009 (000 tons)

| Species (ISSCAAP division) | 1990 | 1994 | 1998 | 2002 | 2006 | 2009 |
|----------------------------|----------------|----------------|----------------|----------------|----------------|----------------|
| Crustaceans | 4.687 | 5.820 | 7.190 | 8.406 | 10.064 | 11.183 |
| Diadrom fish | 2.776 | 3.021 | 3.593 | 4.049 | 4.620 | 5.439 |
| Freshwater fish | 12.529 | 16.636 | 21.976 | 26.349 | 33.762 | 39.542 |
| Saltwater fish | 68.335 | 73.590 | 65.451 | 70.180 | 67.797 | 67.212 |
| Mollusc | 9.100 | 13.368 | 15.184 | 18.038 | 19.999 | 20.087 |
| Other | 5.421 | 8.714 | 9.918 | 12.520 | 16.057 | 19.419 |
| Total | 102.848 | 121.147 | 123.313 | 139.542 | 152.299 | 162.882 |

Source: calculations on FAO data



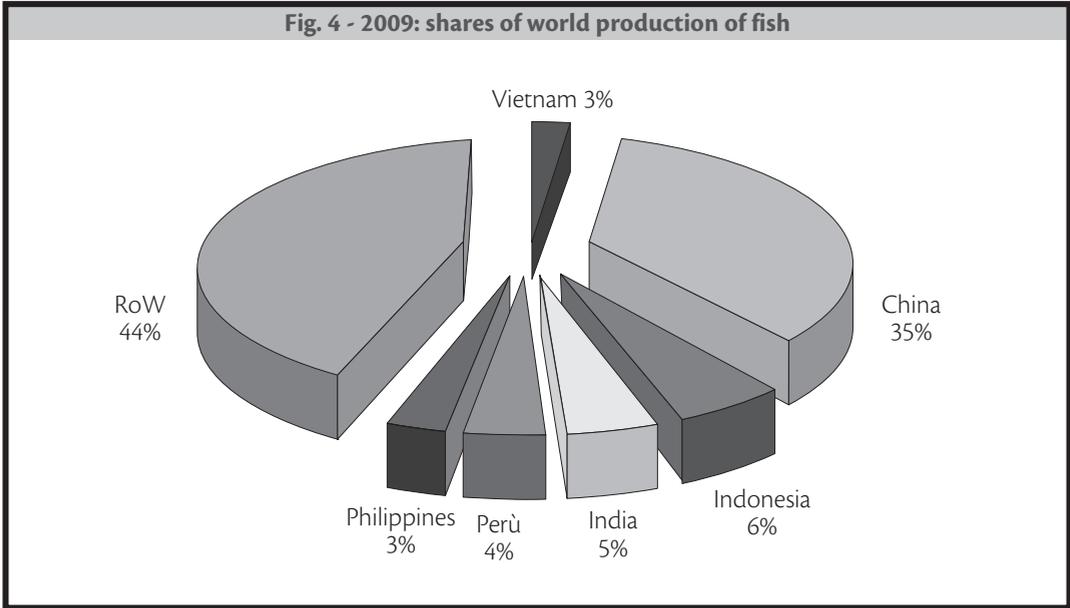
The most significant change occurring in the time period in question, however, affects the type of production, divided according to “fished” and “non-fished” (see table 4). While, in 1990, the non-fished proportion represented only 16% of total production, more recently this has risen to 45% of total production, mostly freshwater and diadromous fish, shellfish, and the rest.

Tab. 4 - Composition of world production by categories

| Species | 1990 | | 2009 | |
|-----------------|-------------|-------------|-------------|-------------|
| | Captured | Other | Captured | Other |
| Crustaceans | 83,9 | 16,1 | 52,6 | 47,4 |
| Diadromous fish | 56,5 | 43,5 | 35,0 | 65,0 |
| Freshwater fish | 43,0 | 57,0 | 22,5 | 77,5 |
| Saltwater fish | 99,5 | 0,5 | 97,1 | 2,9 |
| Molluscs | 60,3 | 39,7 | 32,7 | 67,3 |
| Other | 29,7 | 70,3 | 6,8 | 93,2 |
| Total | 83,6 | 16,4 | 55,2 | 44,8 |

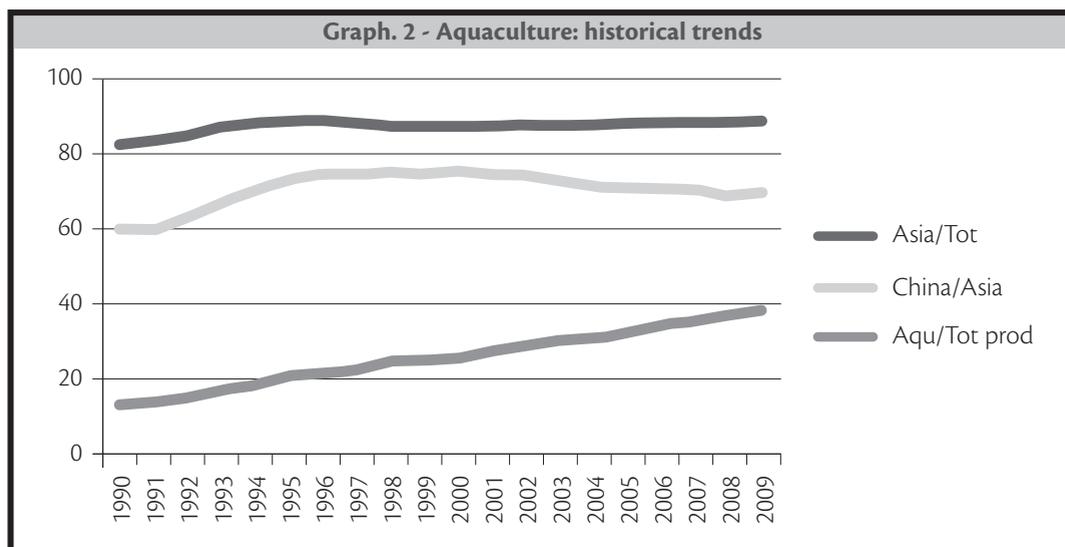
Source: calculations on FAO data

The major producers, as may be expected, are the Asian countries, the largest being China which in 2009 accounted for 37% of world production. Although far behind in terms of percentage shares, it is followed by Indonesia, India, Vietnam, and the Philippines, and the only non-Asian country, Peru (see figure 4).



This final situation is a result of trends that have seen a substantial stability in production in all countries except those in Asia, for which the production in some has tripled (Indonesia), quadrupled (China) or even quintupled (Vietnam).

One of the most significant changes occurring over the last 20 years or so has been the composition of output by type of process that has seen a significant growth in aquaculture production compared to the direct catch, increasing from 16% to 45% of the total. If one excludes the production of those species not intended for human consumption (sponges, pearls, corals, aquatic mammals, etc.), from 13 million tons in 1990 it reached 55 million tons in 2009, i.e. a level four times higher than that at the start. Of the farmed product, 89% is located in Asia (49 million tons) and, of this, over 62% is Chinese, with the trends shown in graphic 2.



4. The European context

Europe has seen its contribution to world production of fish diminish considerably to a market share of around 10% of entire world production. Apart from Norway, in no country within Europe is the level of production of major significance. It is important to note, however, that the fortunes of many local communities are tied to this sector, often living almost exclusively on the basis of the economic state of their fisheries. The situation of the European Union is shown in table 5.

Tab. 5 - Europe: fish captured by country (000 tons)

| Nazione | 1990 | 1993 | 1996 | 1999 | 2002 | 2005 | 2009 |
|--------------------------|--------|--------|--------|--------|--------|--------|--------|
| Denmark | 1.476 | 1.614 | 1.682 | 1.405 | 1.442 | 911 | 778 |
| France | 698 | 679 | 642 | 657 | 703 | 598 | 431 |
| Germany | 326 | 253 | 236 | 239 | 224 | 286 | 250 |
| Ireland | 248 | 308 | 365 | 319 | 319 | 297 | 299 |
| Italy | 374 | 398 | 368 | 285 | 272 | 298 | 254 |
| The Netherlands | 406 | 462 | 411 | 515 | 464 | 555 | 382 |
| Portugal | 333 | 296 | 265 | 213 | 203 | 212 | 200 |
| Spain | 1.131 | 1.100 | 1.190 | 1.194 | 891 | 854 | 905 |
| Sweden | 251 | 342 | 371 | 351 | 295 | 256 | 203 |
| Great Britain | 772 | 865 | 876 | 841 | 690 | 670 | 591 |
| Other European Countries | 14.010 | 10.475 | 11.434 | 10.422 | 10.048 | 9.126 | 9.094 |
| Total | 20.025 | 16.791 | 17.840 | 16.440 | 15.551 | 14.064 | 13.387 |

Source: calculations on FAO data

In the countries where fishing is most important, production has declined over the last decade by about 30% and the extent of the structural nature of this process is evident from the fact that this decrease in production has been simultaneously accompanied (see table 6 below) by a scrapping of the fleet expressed both in numerical terms and in terms of tonnage; that is to say it has drastically reduced both the fishing capacity and the potential fishing effort.

| Nazione | Number of vessels | | | | Gross tonnage | | | |
|-----------------|-------------------|--------|--------|-------|---------------|---------|---------|-------|
| | 2000 | 2005 | 2010 | Δ | 2000 | 2005 | 2010 | Δ |
| Spain | 16.678 | 13.700 | 10.847 | -0,35 | 521.838 | 487.556 | 414.527 | -0,21 |
| France | 8.181 | 7.857 | 7.242 | -0,11 | 224.077 | 215.052 | 174.461 | -0,22 |
| Italy | 17.369 | 14.401 | 13.515 | -0,22 | 232.467 | 212.929 | 186.079 | -0,20 |
| The Netherlands | 1.101 | 829 | 849 | -0,23 | 212.466 | 171.672 | 147.520 | -0,31 |
| Portugal | 10.692 | 9.155 | 8.492 | -0,21 | 117.313 | 107.566 | 101.483 | -0,13 |
| Greece | 19.962 | 18.269 | 17.168 | -0,14 | 107.407 | 93.515 | 88.288 | -0,18 |
| Great Britain | 7.643 | 6.768 | 6.422 | -0,16 | 265.145 | 218.532 | 207.608 | -0,22 |

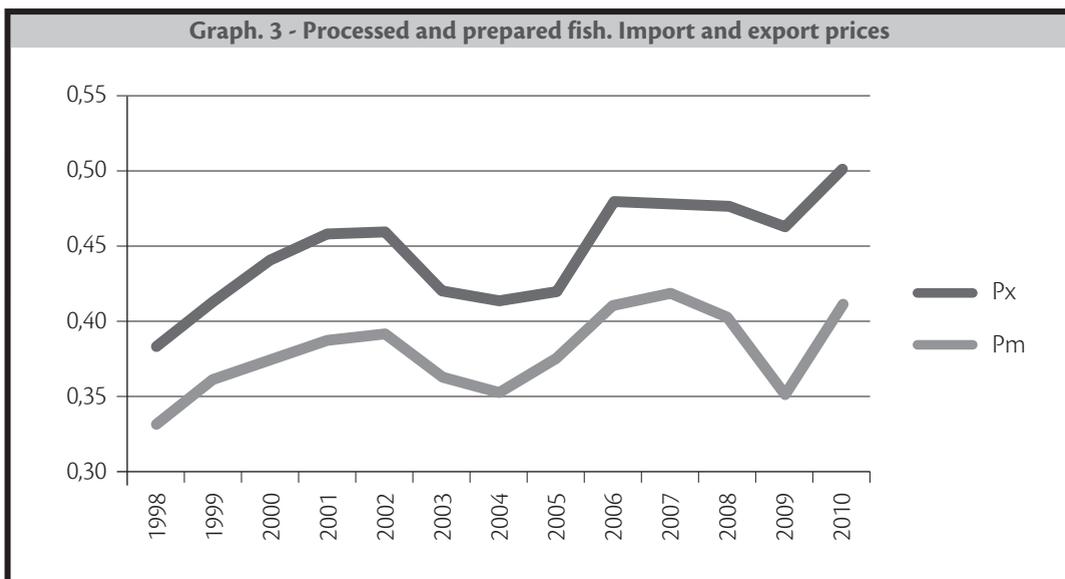
Source: calculations on FAO data

This has meant that EU imports over the years have gradually risen to reach nearly 6.8 million tons in 2010 as can be seen in table 7.

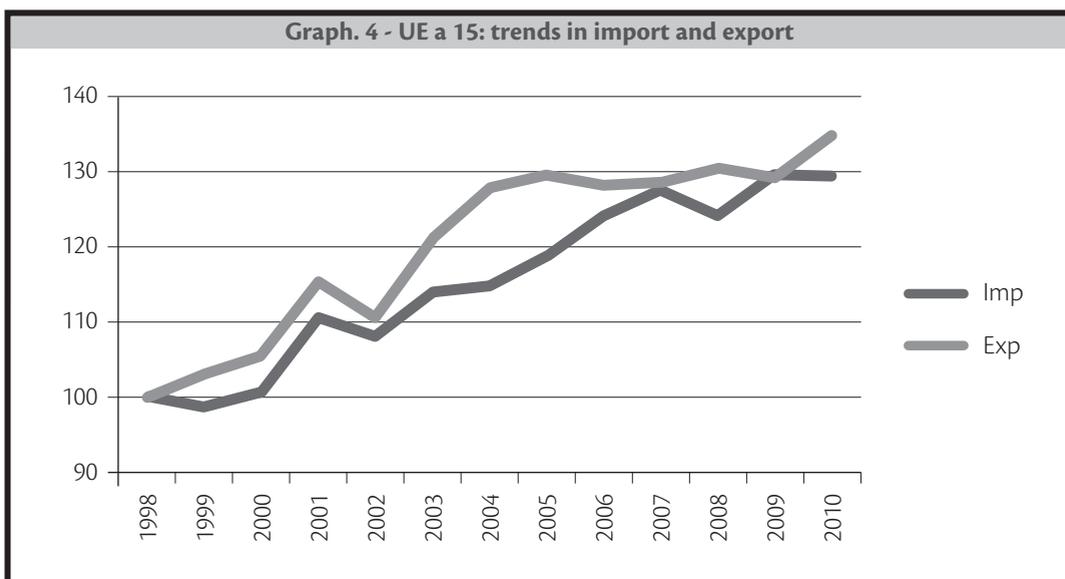
| Product category | 1998 | 2001 | 2004 | 2007 | 2010 |
|-------------------------------------|---------------|--------|--------|--------|--------|
| | Export | | | | |
| Fresh fish, refrigerated and frozen | 21.677 | 25.738 | 27.839 | 27.388 | 30.506 |
| Fillets, and other preparations | 5.988 | 6.573 | 7.768 | 7.886 | 7.434 |
| Crustaceans and Molluscs | 6.333 | 6.957 | 7.875 | 8.483 | 7.920 |
| Total | 33.999 | 39.267 | 43.482 | 43.758 | 45.861 |
| Import | | | | | |
| Fresh fish, refrigerated and frozen | 25.142 | 27.029 | 26.316 | 28.718 | 29.956 |
| Fillets, and other preparations | 14.346 | 16.056 | 17.428 | 19.891 | 20.454 |
| Crustaceans and Molluscs | 12.818 | 14.769 | 16.271 | 18.094 | 17.294 |
| Total | 52.305 | 57.854 | 60.015 | 66.703 | 67.703 |

Source: calculations on FAO data

Exports, however, have also grown, and, in the context of decreased production, this would seem to be linked to the presence of significant re-exports of products with higher added value as evidenced by the level of unit values in the form of outflows, systematically higher than that for imports (see graphic 3 in relation to fish preparation).



It would even seem that this feature has taken on a structural connotation because, although there is a systematic negative balance and an index of trade specialization² that is equally negative, the export trend always lies above that of imports as shown in graphic 4.



² The trade specialization referred to is that summarized in the Normalized Balance provided by the ratio between the total balance of trade (exports minus imports) and the total volume of trade (exports plus imports). For Italy the data in tables 10 and 11 exhibits strong signals suggesting de-specialization in international trade.

The prospectus A on the Financial Framework 2007/2013 of the EFF is shown below to conclude the discussion on the European situation and to synthesize the use of funds made by the major partners and arising from the commitments made with regard to the 5 priority axes.

Prospectus A illustrates the financial framework 2007/2013 of the European Fisheries Fund (EFF) referring both to “convergence” and to “non-convergence”.

| Prospectus A - EU a 27: Financial Framework 2007/13 of the EFF (000 €) | | | | | | | |
|--|------------------|------------------|----------------|------------------|-----------------|----------------|------------------|
| Country | Convergence | | | Non-convergence | | | Total |
| | Funds | Committed funds | Funds paid | Funds | Committed funds | Funds paid | |
| Austria | 187 | 116 | 80 | 5.072 | 2.812 | 2.812 | 5.259 |
| Germany | 96.861 | 55.309 | 33.545 | 56.850 | 30.558 | 13.878 | 153.711 |
| Greece | 176.837 | 102.835 | 26.680 | 30.996 | 17.184 | 5.314 | 207.832 |
| Spain | 945.692 | 538.111 | 234.859 | 186.198 | 103.229 | 51.175 | 1.131.891 |
| France | 34.250 | 18.989 | 6.181 | 181.803 | 100.792 | 68.087 | 216.053 |
| Italy | 318.282 | 177.508 | 79.789 | 106.061 | 58.801 | 24.445 | 424.343 |
| Slovakia | 12.681 | 6.847 | 3.733 | 898 | 435 | 179 | 13.580 |
| United Kingdom | 43.151 | 21.472 | 6.041 | 94.677 | 46.122 | 13.255 | 137.828 |
| Portugal | 223.943 | 124.981 | 59.165 | 22.542 | 12.498 | 5.222 | 246.485 |
| Hungary | 34.291 | 15.858 | 5.597 | 560 | 259 | 78 | 34.851 |
| Ireland | 0 | 0 | 0 | 42.267 | 20.590 | 20.590 | 42.267 |
| Cyprus | 0 | 0 | 0 | 19.724 | 10.935 | 8.910 | 19.724 |
| Sweden | 0 | 0 | 0 | 54.665 | 30.306 | 19.495 | 54.665 |
| Finland | 0 | 0 | 0 | 39.489 | 21.871 | 11.388 | 39.489 |
| Belgium | 0 | 0 | 0 | 26.262 | 12.793 | 3.677 | 26.262 |
| Denmark | 0 | 0 | 0 | 133.675 | 74.110 | 44.854 | 133.675 |
| The Netherlands | 0 | 0 | 0 | 48.578 | 26.932 | 11.648 | 48.578 |
| Bulgaria | 80.010 | 38.156 | 11.201 | 0 | 0 | 0 | 80.010 |
| Czech Republic | 27.107 | 14.449 | 7.087 | 0 | 0 | 0 | 27.107 |
| Latvia | 125.016 | 62.504 | 39.696 | 0 | 0 | 0 | 125.016 |
| Lithuania | 54.713 | 28.548 | 18.446 | 0 | 0 | 0 | 54.713 |
| Malta | 8.372 | 4.030 | 796 | 0 | 0 | 0 | 8.372 |
| Poland | 734.093 | 361.733 | 139.941 | 0 | 0 | 0 | 734.093 |
| Romania | 230.714 | 103.832 | 32.300 | 0 | 0 | 0 | 230.714 |
| Slovenia | 21.640 | 11.754 | 3.030 | 0 | 0 | 0 | 21.640 |
| Estonia | 84.568 | 41.883 | 20.197 | 0 | 0 | 0 | 84.568 |
| Total | 3.252.409 | 1.728.916 | 728.365 | 1.050.317 | 570.229 | 305.007 | 4.302.726 |

Source: EU Commission. Fourth annual report on Implementation of the European Fisheries Fund. Brussels, 2011

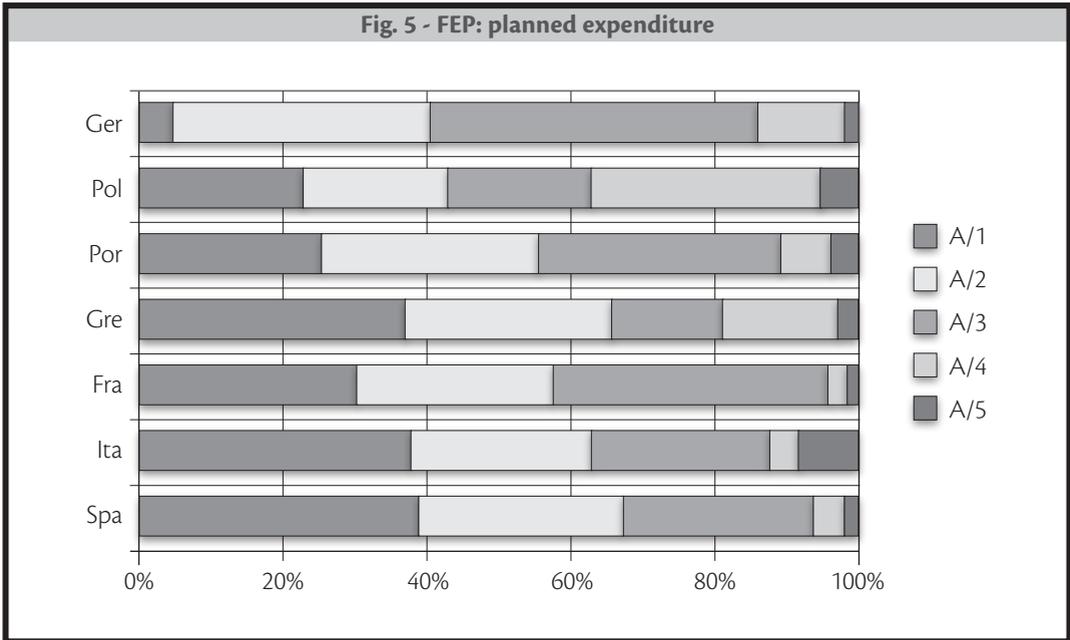
The sum involved is 4.3 billion euros, more than half of which is destined for Spain (26%), Poland (17%) and Italy (10%). Prospectus B gives the distribution of the national totals for each of the five priority axes³ for the countries most involved in the EFF, showing a significant diversity in the programming of expenditure which the major European partners have given themselves.

It is obvious that Germany did not intend to allocate large sums for fleet adaptation, preferring to programme spending measures of common interest. Poland seems to have put sustainable development of fishery zones at the centre of its initiatives, while Italy, Greece and Spain have prioritized the adaptation of the fleet. Common to all countries in the table is aquaculture, fishing on inland waters, and processing and marketing of fish products (see fig. 5).

| Prospectus B - EU a 27: Financial Framework 2007/13 of the EFF (000 €) | | | | | | |
|---|------------------|---------------|---------------|---------------|---------------|--------------|
| Country | Axis 1 | Axis 2 | Axis 3 | Axis 4 | Axis 5 | Total |
| | 000 Euros | | | | | |
| Spain | 442,9 | 322,0 | 298,8 | 49,2 | 19,0 | 1.131,9 |
| Italy | 161,3 | 106,1 | 106,1 | 17,0 | 33,9 | 424,3 |
| France | 65,6 | 59,0 | 83,0 | 5,7 | 2,7 | 216,1 |
| Greece | 77,3 | 59,7 | 32,3 | 33,3 | 5,3 | 207,8 |
| Portugal | 62,9 | 74,2 | 83,4 | 17,4 | 8,6 | 246,5 |
| Poland | 168,8 | 146,8 | 146,8 | 234,9 | 36,7 | 734,1 |
| Germany | 7,5 | 54,9 | 70,2 | 18,6 | 2,5 | 153,7 |
| Planned percentage distribution | | | | | | |
| Spain | 39,1 | 28,5 | 26,4 | 4,3 | 1,7 | 100 |
| Italy | 38,0 | 25,0 | 25,0 | 4,0 | 8,0 | 100 |
| France | 30,4 | 27,3 | 38,4 | 2,6 | 1,2 | 100 |
| Greece | 37,2 | 28,7 | 15,6 | 16,0 | 2,5 | 100 |
| Portugal | 25,5 | 30,1 | 33,8 | 7,1 | 3,5 | 100 |
| Poland | 23,0 | 20,0 | 20,0 | 32,0 | 5,0 | 100 |
| Germany | 4,9 | 35,7 | 45,7 | 12,1 | 1,6 | 100 |

Source EU Commission, Fourth annual report on Implementation (op. cit.)

³ The five priorities are: A/1 Fleet adaptation - A/2- Aquaculture, inland fishing, processing and marketing; A/3- Measures of common interest; A/4- Sustainable development of fishery areas; A/5- Technical support.



5. Italian events

Over the last twenty years, the importance of fishing in Italy has been slowly decreasing both with regard to the fished and the non-fished (farmed) production (table 8). However, despite this decline, Italian aquaculture, with over 230,000 tonnes produced in 2010, still plays an important role in the context of the EU, representing a market share of around 15%.

Tab. 8 - Italy: fish raised in aquaculture

| Species | Tons | thousand € | Species | Tons | thousand € |
|-----------|--------|------------|---------|---------|------------|
| Sea bass | 9.800 | 70.500 | Mullet | 3.800 | 12.000 |
| Sea bream | 8.800 | 57.200 | Clams | 120.000 | 78.000 |
| Trout | 40.000 | 11.200 | Cockles | 40.000 | 144.000 |
| Eel | 1.200 | 11.200 | Other | 7.150 | 158.800 |
| Sturgeon | 1.380 | 14.000 | Total | 232.130 | 556.900 |

Source: calculations on FAO data

Where, however, things have decisively worsened in recent years is in fisheries. With a reduction of 19% recorded during the 1990s and a further 17% in the course of the past ten years, Italy has reduced its contribution to EU production to just over 3%. The number of boats and their gross tonnage have both fallen by about 10%. The structural characteristics of the Italian fleet are summarized in table 9, showing the prevalence, both in terms of engine power and tonnage, of the trawler system compared with all the other fishing techniques (Irepa, 2007).

Tab. 9 - Specifications of the Italian fishing fleet (2009)

| Systems | Number | Gross Tonnage | Power (KW) | Crew | Average days |
|--------------------|---------------|----------------|------------------|---------------|---------------|
| Trawlers | 2.679 | 113.322 | 536.656 | 9.021 | 158,66 |
| Seine netters | 134 | 10.400 | 48.349 | 705 | 160,54 |
| Seiners | 310 | 19.808 | 83.690 | 2.178 | 100,26 |
| Hydraulic dredges | 700 | 9.289 | 75.500 | 1.417 | 86,59 |
| Small fishing | 8.765 | 16.484 | 244.198 | 13.657 | 130,32 |
| Polyvalent passive | 491 | 6.694 | 68.437 | 1.276 | 134,51 |
| Longliners | 192 | 6.015 | 38.829 | 713 | 126,22 |
| Total | 13.271 | 182.012 | 1.095.659 | 28.967 | 128,16 |

Source: Calculation on FAO data

In the general context the incidence of “small-scale fishing” is striking, in terms of boats, crews and engine power, and demonstrates the substantial fragmentation of Italian productive capacity and the relative uncertainty overshadowing the entire industry with an average stay of just 128 days at sea for over 13,000 vessels.

The data in table 10 also suggest a substantial crisis, the catch having declined by 20% over the past six years with peaks of 25% for small-scale fisheries, and by as much as 42% for mixed systems.

The reduction in catches has, of course, also reduced revenues that, in 2004, amounted to 1,380 million euros, while in 2009 they totalled 1,102 million euros, a decrease of 20%. These data, given in current values, do not take into account the phenomenon of inflation that, over the six years, has had quite a significant effect on the purchasing power of incomes.

Tab. 10 - Trends in catches (tonnes) and revenue (€'000) per system (tonnes and €000)

| Systems | 2004/05 (a) | 2006/07 (b) | 2009/10 (c) | (c)/(a) | Revenue 2004 | Revenue 2010 |
|--------------------|----------------|----------------|----------------|-------------|-----------------|-----------------|
| Trawlers | 100.895 | 96.805 | 77.882 | 0,77 | 621 | 536 |
| Seine netters | 43.673 | 47.152 | 42.896 | 0,98 | 50 | 50 |
| Seiners | 43.360 | 47.247 | 33.450 | 0,77 | 109 | 50 |
| Hydraulic dredges | 20.612 | 26.005 | 20.727 | 1,01 | 81 | 63 |
| Small fishing | 48.196 | 44.022 | 35.978 | 0,75 | 341 | 276 |
| Polyvalent passive | 23.846 | 15.370 | 13.814 | 0,58 | 178 | 127 |
| Total | 280.582 | 276.600 | 224.745 | 0,80 | 1.380 | 1.102 |

Source: Calculations on Mipaaf-Irepa data

In table 11, for 2010, the distribution of catches and related revenues are shown for those regions that, more than others, see fishing as an important activity. In general, over 40% of the value of the catch is concentrated on the Adriatic coast, 27% is landed in Sicily and a further third in the other coastal regions of Italy. The data show that catches and revenues are not distributed on a strictly proportional basis. This can be clearly deduced from the catch/income ratio reported in the last column which shows that Sicily (1.32) has products of far higher value than those from other sources.

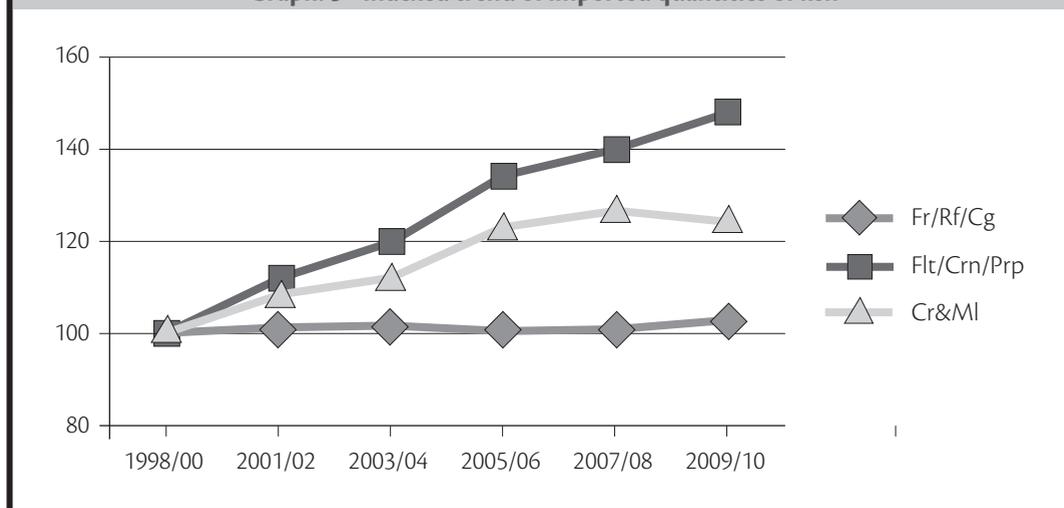
Tab. 11 - Catches by revenues and by region (2010)

| Region | Catches (a) | | Revenue (b) | | (b)/(a) |
|---------|-------------|------|-------------|------|---------|
| | Tonnes | % | €000 | % | |
| Puglia | 34.842 | 15,6 | 184.000 | 16,7 | 1,07 |
| Marche | 24.992 | 11,2 | 120.355 | 10,9 | 0,97 |
| Em. Rom | 22.181 | 9,9 | 56.720 | 5,1 | 0,52 |
| Veneto | 23.428 | 10,5 | 64.490 | 5,8 | 0,56 |
| Sicilia | 45.032 | 20,2 | 293.770 | 26,6 | 1,32 |
| Other | 72.532 | 32,5 | 383.465 | 34,8 | 1,07 |

Source: calculations on Mipaaf-Irepa data

The Italian position in the context of trade, shown in tables 12 and 13, is marked by a substantial stability in the quantities exported set against an increase of over 20% in the quantities imported. In the last two years the ratio between the volumes imported and exported has increased from one to seven, while that for its economic values is from one to nine. The terms of trade also indicate that the implied value of imports is consistently lower than that of exports (overall, € 3,14 a tonne compared to € 4,16 a tonne in 2010) with the exception of crustaceans and molluscs.

Graph. 5 - Indexed trend of imported quantities of fish



On the import side (see graphic 5) the leap in the trade deficit is due not so much to the fresh, chilled and frozen products as to the two other types of product: of 25% for shellfish (i.e. crustaceans and molluscs) and 50% for fish fillets, meat and prepared fish.

Tab. 12 - Italy: fish exports by product category

| Category | 1998/00 | 01/02 | 03/04 | 05/06 | 07/08 | 09/10 |
|---------------------------------|--------------------|-------|-------|-------|-------|-------|
| | Quantity (000qli) | | | | | |
| Fish, fresh, chilled and frozen | 546 | 516 | 538 | 600 | 575 | 567 |
| Fillets, meat preparations and | 41 | 46 | 46 | 80 | 85 | 85 |
| Crustaceans and molluscs | 442 | 368 | 340 | 386 | 404 | 393 |
| Total | 1.029 | 930 | 924 | 1.066 | 1.064 | 1.044 |
| | Values (mio Euros) | | | | | |
| Fish, fresh, chilled and frozen | 120 | 126 | 133 | 168 | 164 | 142 |
| Fillets, meat preparations and | 21 | 23 | 21 | 32 | 39 | 38 |
| Crustaceans and molluscs | 115 | 149 | 135 | 155 | 154 | 148 |
| Total | 256 | 298 | 289 | 355 | 357 | 328 |

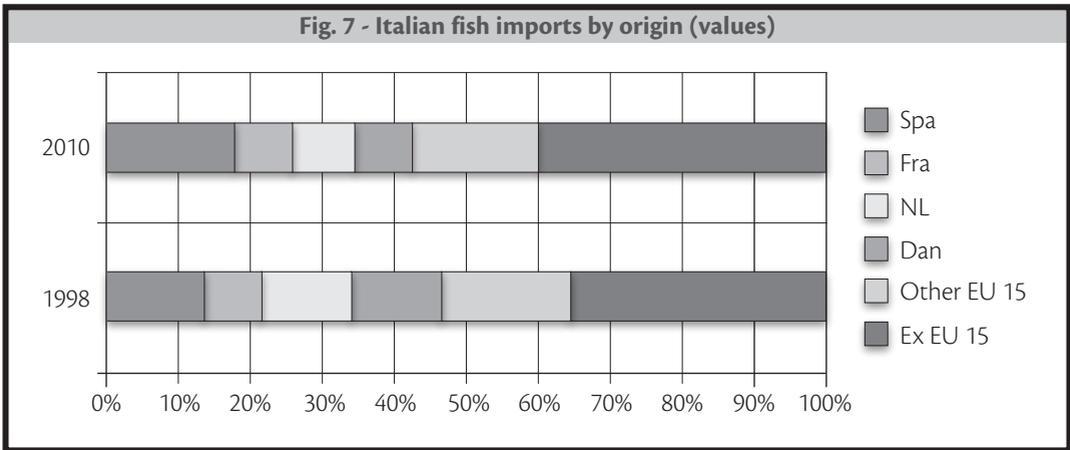
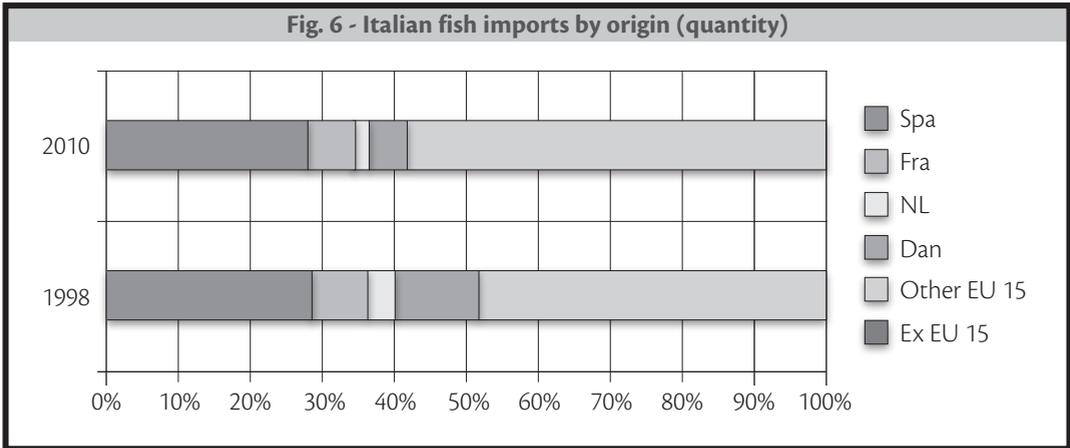
Source: calculated on Eurostat data

Tab. 13 Italy: fish imports by product category

| Category | 1998/00 | 01/02 | 03/04 | 05/06 | 07/08 | 09/10 |
|---------------------------------|--------------------|-------|-------|-------|-------|-------|
| | Quantity (000qli) | | | | | |
| Fish, fresh, chilled and frozen | 2.075 | 2.104 | 2.109 | 2.081 | 2.095 | 2.125 |
| Fillets, meat preparations and | 1.004 | 1.124 | 1.203 | 1.345 | 1.402 | 1.482 |
| Crustaceans and molluscs | 2.692 | 2.924 | 3.014 | 3.312 | 3.409 | 3.354 |
| Total | 5.771 | 6.151 | 6.326 | 6.738 | 6.905 | 6.961 |
| | Values (mio Euros) | | | | | |
| Fish, fresh, chilled and frozen | 680 | 734 | 732 | 819 | 837 | 889 |
| Fillets, meat preparations and | 503 | 599 | 588 | 685 | 720 | 763 |
| Crustaceans and molluscs | 901 | 1.096 | 1.121 | 1.254 | 1.283 | 1.245 |
| Total | 2.084 | 2.428 | 2.441 | 2.758 | 2.841 | 2.897 |

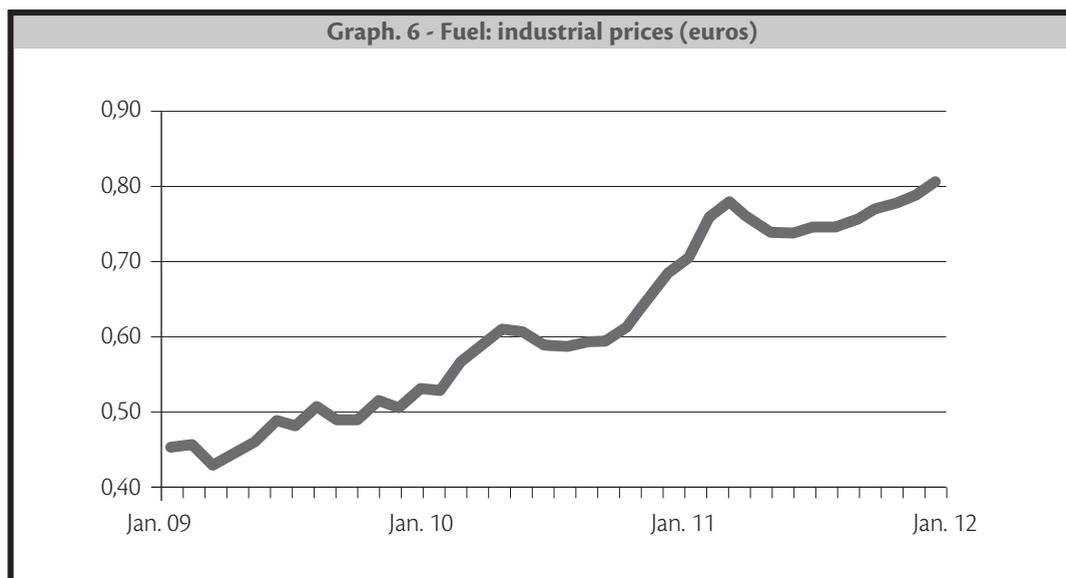
Source: calculated on Eurostat data

The origin of these quantities of imported fish is mostly outside the EU even if Italy's largest supplier would appear to be Spain with a share of nearly 30%. The balance of the discussion changes completely if, rather than considering the quantities imported, reference is made to their value. In this case, the Community partners have more than 60% of the market. Most important in this respect are, in order, the Netherlands, Denmark and France (see figures 6 and 7).



What ultimately emerges is greater exposure to foreign suppliers. This does not stem from the demand side, which is indeed rather stagnant, but is the result of a shortage of domestic product brought about by the decreased production of the Italian fleet.

This is the scenario in which fishing businesses have found themselves in recent times; one that has become very difficult for a range of reasons. The first is a direct result of the stagnation in demand to which reference was made earlier, and is linked to a fall in prices that has immediately made itself felt in the pockets of the operators in the upstream section of the supply chain. A second source of discomfort lies in the full implementation of the provisions of EC Regulation No. 1967/2006 which made its effects felt throughout 2011, rendering the catch much more difficult to complete. Finally, and certainly not least, given the effect it has had, is the rising price of industrial diesel fuel, as shown in graphic 6, the price of which has rocketed since November 2010 by as much as 30% (April 2011) and that, in early 2012, has unfortunately resumed its upward trend. Given that, within the costs of production, fuel accounts for 50%, when this threshold is exceeded for certain types of fishing, one can easily understand the widespread suffering and discontent that has come to the surface in many Italian flotillas (MiPAAF, 2007b).



All this is happening despite significant financial transfers, from both national and European sources, being made to the sector. It is acceptable, therefore, to ask whether national and European economic commitment responds to a precise policy plan or whether the shortcomings of a few years ago referred to in the Commission's Green Paper still persist, in particular as regards:

- the lack of clear policy objectives;
- an unwillingness to ensure compliance with the rules;
- a fundamental weakness of the decision-making system.

6. Conclusions

This study is a critical analysis of fishing and aquaculture, taking into consideration trends in their production and trade at an international, European and national level. The interest in this sector stems from its strategic role for the food industry: fish are a source of animal protein with nutritional characteristics of great importance and represent a significant alternative to meat consumption. However, the sector also has important specific characteristics resulting from its nature in exploiting a renewable resource.

The data show that over the last twenty years both production and trade in fish have been affected by profound changes, the salient features of which are substantial stability in the volume of fishing, a strong increase in the share of production from aquaculture and a progressive strengthening of production with a greater service content (fillets, prepared seafood, etc.). Finally the leading role being taken by Asian countries, especially in the production of farmed fish, should be noted.

The basic stability in the volume of fishing represents an element of considerable interest, especially in the light of strong growth in demand and the progressive upgrading of fleets in particular with regard to deep sea and fishing for pelagic species. It represents evidence, albeit indirect, of the progressive depletion of fish as a resource that has thus fuelled the considerable

growth in production from fish farms. The self-same objectives of the Common Agricultural Policy and those outlined for the fisheries and aquaculture sector, refer to the theme of sustainability ever more explicitly as the directive shaping public intervention. It is no coincidence that among the objectives of the proposed reform re-stocking and subsequent conservation of stocks are cited, to be pursued through the adoption of the parameter of MSY (maximum sustainable yield), and the progressive reduction in the proportion of discards of unmarketable species. This rule is hypothetical, of course, and the implementation of systems of documentation and control are very complex; concerns as to the effectiveness of these norms have been expressed by many commentators.

Finally, as far as the Italian situation is concerned, and in the light of the new reform proposal, the work carried out illustrates the progressive loss in importance of the activities of the “fish industry” and in particular with regard to fishing itself. With a highly fragmented structure of productive capacity and a gradual decline in catches, in recent years the fishing industry has seen a decline of about 20% in revenues. However, the fisheries sector continues to play an important role in Italy both in the maintenance of the social fabric and in terms of the conservation and enhancement of cultural identities. In this sense, the reform proposal seems to give some degree of protection for artisanal fisheries because of their exemption from the application of the system of transferable fishing concessions and the financial measures for the benefit of local economies and small-scale fisheries.

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MEDITERRANEAN AGRICULTURAL PRODUCT TRADE BETWEEN THE EU AND MOROCCO IN THE PERSPECTIVE OF THE NEW BILATERAL AGREEMENT: MAIN CAUSES OF IMBALANCE AND POSSIBLE EFFECTS

JEL classification: F13, F15

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Abstract. *In this article the possible repercussions of the new bilateral trade agreement between Morocco and the European Union concerning the fruit and vegetable sector have been examined. Through appropriate mathematical indices, such as the “revealed comparative advantage” (RCA) approach pioneered by Balassa, the competitive position of Morocco over its trading partners in the EU and especially over the Mediterranean Member States has been evaluated. The aim is to discover features of trade of Morocco and the EU in the fruit and vegetable sector, and changes during the period 2000 - 2010. In particular, the effects of the new bilateral trade agreement on EU countries such as Italy, Spain and France, i.e., the traditional producers of these goods, have been examined. RCA of Morocco over the EU and RCA of the EU over Morocco have been calculated by conducting research using UN Comtrade sources. Moreover, through the “revealed trade advantage” (RTA) introduced by Vollrath, the global competitiveness of the fruit and vegetables sector in both Morocco and the EU have been evaluated.*

Finally, the degree of intra-industry trade between Morocco and the major European producers of fruit and vegetables has been calculated. The results highlight the strong dominance of Morocco, and point to the possibility that the new bilateral trade agreement may cause an increase in economic instability in many European areas struggling against Moroccan competition in certain agricultural sectors. In countering this situation, questions concerning agri-food safety, agri-environmental protection and other aspects could become relevant in the near future. The importance of these questions is that they may point to the comparatively low levels of restrictions often faced by the Moroccan producers as the real cause of their actual competitive advantage in some strategic European agri-food sectors. Despite the limitations of RCA indices obtained in this study, they are expected to offer further insight into the competitiveness of the Moroccan fruit and vegetables sector and its implications for trade with the EU in the near future.

Keywords: *Fruit and vegetable sector, bilateral EU agreements, Morocco*

1. Introductory note

In recent years the system of international trade relations has evolved from simple forms of trade integration (Shallow Integration), which were essentially limited to the liberalisation of technical barriers, into more complex forms (Deep Integration), in which the liberalisation

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process concerns the system of barriers to entry in international markets. In particular, together with tariff barriers, the latter include increasingly important non-tariff barriers, such as quotas, export restrictions, administrative barriers and above all – as they have recently been indicated by various parties (Borghini, 2003; Claar and Nölke, 2009) – measures concerning such issues as the environment, food safety and workers' rights. Although these latter measures exert a certain influence, the so-called *non-explicit barriers icon* mainly corresponds to the socio-political factors, institutions, culture and physical distance of the contracting countries, as well as other factors such as the intensification of globalisation, the expansion of mass distribution systems and development of communication technologies (Banterle, 2009).

In brief, all these issues affect the food market, and therefore, they have been of increasing importance in trade policy strategies implemented by the European Union, particularly those which pertain to bilateral and regional relations. In this context, through the 200 bilateral agreements concluded so far (DG Trade, 2011), the EU is committed not only to strengthening its network of trade relations with emerging economies (Russia, China and India) and developing countries (Mercosur in particular), but also to deepening and building on its “historical” relations with North African countries across the Mediterranean.

Issues arising from the trade between these Third Countries and EU countries have been the subject of numerous scientific studies, which highlight how some countries on the southern shore of the Mediterranean Sea are increasing their share of the EU market, with the consequent deterioration of the competitive capability of European countries (Crescimanno and Galatians, 2007; Castellini and Pisano, 2008), especially in vegetable production (Perito, 2006).

Concerning trade in these products, the Kingdom of Morocco's recent policy – in place for the last decade – stands out, as it addresses the productivity of the Moroccan agricultural sector by planning to increase the land area allocated to fruit and vegetables, for which there are currently special conditions of preferential market access (Eagle, 2005; Cioffi, 2007).

In fact, the Kingdom of Morocco is one of the Mediterranean countries in North Africa that have benefited from the prevailing conditions of preferential trade with the EU as a result of the first trade agreement, which initially entered into force in 1969, and was later re-negotiated at the end of the 1990s, resulting in the establishment of the “Association Agreement” (effective from 1 March 2000), in which the EU and Morocco are expected to progressively establish greater liberalisation in their reciprocal trade. The anticipation of the entry into force of the latter agreement gave rise to an intense debate – sometimes accompanied by controversy – among European agricultural stakeholders, due to concerns over such issues as possible risks of instability and poor standards of food safety, environmental protection, and conditions of workers.

Taking a cue from the elements that contribute to the definition of the liberalisation measures in the trade in food products between the EU and the Kingdom of Morocco (see Proposal for a Council Decision of the European Union 2010/0248)¹, one wonders what are currently the key elements which characterize the fruit and vegetables trade between EU and Morocco.

Considering the economic relevance of the fruit and vegetable sector in Mediterranean coun-

¹ On the conclusion of the Agreement based on the correspondence between the European Union and the Kingdom of Morocco concerning reciprocal liberalisation measures for agricultural products, processed agricultural products, fish and fishery products, the replacement of Protocols No 1, 2 and 3 and their annexes and amendments to the Agreement establishing an association between the European Communities and their Member States, on the one side, and the Kingdom of Morocco on the other (COM (2010) 485 final of 16/09/2010).

tries², the aim of the paper is the assessment of sectoral competitiveness of Morocco and EU Mediterranean countries trading with Morocco. Through specific *revealed comparative advantage* (RCA) indices, the specialization and competitiveness of Morocco and its main Mediterranean partners of the EU were analysed. The results achieved contribute to the assessment of competitive pressure on the fruit and vegetable market in the perspective of a new bilateral agreement between EU and the Kingdom of Morocco.

In this context, the aim is to determine whether the socio-economic agents involved in the vigorous debate have reason to be concerned about the significant divergences over the new bilateral agreement, given the protests in many southern European regions.

In particular, in line with the aim of this analysis, the monetary value of international trade is used to quantify the economic phenomena studied. As such, this value is analysed for the evaluation of sectoral competitiveness through the use of special methods of estimation.

There are several official statistical sources to identify the monetary value of international trade. In this study, United Nations Commodity Trade Statistics Database (UN Comtrade), which is universally recognized due to its internationally harmonized nomenclature, has been used.

The key points of the approach taken into account in this work are as follows:

- Information on a new bilateral trade agreement between Morocco and the European Union;
- Assessment of the performance of the commercial exchange of fruit and vegetables between the EU and Morocco, in order to identify and quantify the import/export trade between the partners, and estimating the absolute sectoral balance in order to detect the effects on agricultural product trade and the agri-food trade balance of the Kingdom of Morocco.
- Assessment of the sectoral competitiveness of the EU and Morocco for fruit and vegetable products subject to liberalisation in the new bilateral agreement, through appropriate trade indices that measure competitive advantage.
- With reference to the emerging scenario concerning the degree of specialization in the international trade in fruit and vegetables subject to liberalisation (otherwise identified as “strong” products), identification of the possible advantages and disadvantages of the entry into force of the new bilateral agreement between the EU and the Kingdom of Morocco.

2. Theoretical framework

This research is based on the concept of *revealed comparative advantage* (RCA) for calculating sectoral competitiveness through the relative advantage or disadvantage of a certain country in a certain class of goods or services as evidenced by trade flows. The RCA is based on the traditional Ricardian theory about comparative advantage and it is commonly referred to as the Balassa Index. Since its first formulation (Balassa, 1965), the RCA index has been revised and modified into formulations capable of assessing the competitive position of a country “A” for good “X” not only in the world market (Vollrath, 1991), but also relative to its bilateral exchange with another country “B” (Fertő and Hubbard, 2001; Mathur and Kumar, 2009).

² It should be noted, however, that within this decade, sales could have suffered from the effects of the new Regulation (EC) No 1234/2007 (Single CMO Regulation) “establishing a common organization of agricultural markets and on specific provisions for certain agricultural products” activated by the Implementing Regulation (EU) No 543/2011 of the Commission, due to the fact that Morocco is the only country on the southern shore of the Mediterranean to obtain approval by complying with marketing standards for fresh fruit and vegetables prior to importation into the European Union.

The RCA index, however, does not reveal the origins of comparative advantage. According to the Heckscher-Ohlin theorem, trade flows between countries is based on factor endowments. It states that a country will export goods that use its abundant factors intensively and import goods that use its scarce factors intensively. The similarity of factor endowments for a given good in two countries shows if inter-industry or intra-industry trade between these countries exists (Krugman, 1979). In the literature there are several indices that measure the degree of intra-industry trade between two countries and the most widely used is the Grubel-Lloyd Index (1975).

With reference to agricultural products, the trade liberalisation between Mediterranean Partner countries (MPCs) and the EU was one of the most important topics covered in the scientific debate. In this context, the trade liberalisation in the fruit and vegetable sector is difficult to represent in trade models because of the special characteristics of the major traded products (e.g. product differentiation and seasonality). However studies have often pointed out that this sector potentially loses by greater openness of trade (Chemingui, Thabet, 2001; Chevassus et al. 2005; García Álvarez-Coque *et al*, 2007; Emlinger et al, 2010).

Despite the relevance of the topic, the studies on trade liberalisation in the fruit and vegetable sector between MPCs and EU countries are few and even fewer are studies on the effects of trade liberalisation based on the RCA approach. One of the most interesting (Din, Zugman, 2008) examines the effects of trade liberalisation on fruit and vegetables from the Southern Mediterranean to EU countries through the changes in comparative advantage in the major exported products.

The complexity of the fruit and vegetable sector makes it difficult to build trade models (García Álvarez-Coque, Galduf, 2007). For this reason, knowledge of the structure of the fruit and vegetable trade (inter-industry or intra-industry) may be useful to see if the competitive advantage between countries is due to better factor endowments (typical situation of inter-industry trade) or to economies of scale and to horizontal and vertical differentiation of fruit and vegetable production that can better respond to consumer preferences (typical situation of intra-industry trade).

In this context, the RCA and intra-industry index may contribute to the knowledge of the fruit and vegetable trade between Morocco and the EU in the perspective of the scenario designed by the new bilateral agreement.

3. The negotiating context

The first commercially-oriented association agreement between the European Community and the Kingdom of Morocco dates back to 1969, but the gradual liberalisation of agricultural-product trade between the EU and Morocco did not start until the Barcelona Conference in 1995, and continued with Euro-Mediterranean Agreement entering into force on 1 March 2000³. Since 2005 official negotiations initiated by the European Commission have been in progress. During this process, in 2008 the Kingdom of Morocco was granted the “advanced status” in its trade with the EU, consolidating a privileged partnership in some key sectors, such as agriculture. At the end of the current negotiations, conducted through the exchange of letters, an agreement will be reached with a view to making the due changes to the Association Agreement with Morocco.

The proposed amendment to the regimes and tariff quotas on trade and import-export of agri-

³ Official Journal of the European Union L 70, 18 March 2000.

cultural products, processed agricultural, fish and fishery products will offer an interesting analysis in terms of impact, and will vary according to the sector of production, i.e., agriculture or fisheries.

On the one hand, therefore, through the liberalisation of European exports of agricultural products to Morocco, the EU could strengthen its position in an important market; on the other, a total liberalisation of fruit and vegetable imports from Morocco could mean excessive market imbalances for European products⁴ under the same competitive pressure.

Finally, an aspect peculiar to the proposed amendment to the EU-Morocco Association Agreement is the safeguarding the stakeholders' continuous reciprocal compliance with obligations regarding sanitary and phytosanitary measures. The European Parliament⁵ itself ensures that agricultural imports to the EU provide European consumers with the same guarantees provided by European production methods.

After a vigorous debate, members of European Parliament voted, in February 16th 2012, with 369 in favour, 225 against and 31 abstentions despite a hostile campaign led in particular by the Spanish, Italian and French delegates. This result showed the political aspect of the agreement. In fact, the trade deal was intended to boost EU-Morocco ties and supported the sensitive transition to democracy following the Arab spring. In that sense, the majority in the European Parliament considered this positive vote as a way of alleviating economic, migratory and security problems in northern African countries, disregarding the possible negative repercussions on European agriculture and farmers' incomes.

4. Methodology

The evaluation of competitive advantage between the EU and Morocco in the fruit and vegetables sector has been made through an analysis based on the *revealed comparative advantage* (RCA).

It is based on three specific indices provided by the literature.

The first is aimed at assessing the competitive advantage of the EU and Morocco concerning their mutual exchange of fruit and vegetables. Here the RCA index formulation, proposed by Mathur and Kumar has been used in order to calculate the RCA index of both Morocco over the EU (RCA_{MEU}) and the EU over Morocco (RCA_{EUM}):

$$RCA_{MEU} = \frac{X_{mjeu} / X_{mteu}}{X_{wjeu} / X_{wteu}}$$

Where:

- RCA_{MEU} is the RCA index of Morocco over the EU for the good "j"; X_{mjeu} represents total exports of the good "j" from Morocco to the EU; X_{mteu} represents the total exports from Morocco to the EU; X_{wjeu} represents total exports of the good "j" from the rest of the world to the EU; X_{wteu} represents the total exports to the EU from the rest of the world.

⁴ Except for pasta.

⁵ Through its resolution on EU agriculture and international trade, 8 March 2011.

The EU's competitiveness is determined similarly as follows:

$$RCA_{EUM} = \frac{X_{eujm} / X_{eutm}}{X_{wjtm} / X_{wtm}}$$

The RCA indices between Morocco and its main Mediterranean trade partners in the EU (France, Spain and Italy) have also been calculated with the same methodology. In the context of bilateral trade between Morocco and the EU, if RCAMEU for the good “j” is greater than the respective RCAEUM, this means that Morocco is more competitive than the EU in the mutual exchange of the good “j”, and vice versa.

The second indicator refers to the competitive advantage of the EU and Morocco in global markets of fruit and vegetables products. The following formula was used (Vollrath, 1991):

$$RTA = \frac{\left\{ \frac{X_{ij}}{\left(\sum_i X_{ij} \right) - X_{ij}} \right\}}{\left\{ \frac{M_{ij}}{\left(\sum_i M_{ij} \right) - M_{ij}} \right\}} = \frac{\left[\frac{\left(\sum_j X_{ij} \right) - X_{ij}}{\left[\left(\sum_j \sum_i X_{ij} \right) - \left(\sum_j X_{ij} \right) \right] - \left[\left(\sum_i X_{ij} \right) - X_{ij} \right]} \right]}{\left[\frac{\left(\sum_j M_{ij} \right) - M_{ij}}{\left[\left(\sum_j \sum_i M_{ij} \right) - \left(\sum_j M_{ij} \right) \right] - \left[\left(\sum_i M_{ij} \right) - M_{ij} \right]} \right]}$$

Where:

- RTA is the Relative Trade Advantage;
- X_{ij} Exports of the good “i” in the country “j”;
- $\sum_j X_{ij}$ Total exports of all other products in the country “j”;
- $\sum_i X_{ij}$ Total global exports of the good “i”;
- $\sum_j \sum_i X_{ij}$ Total exports of other products in the rest of the world;
- M_{ij} Imports of the good “i” in the country “j”;
- $\sum_i M_{ij}$ Total imports of all other products in the country “j”;
- $\sum_j M_{ij}$ Total global imports of the good “i”;
- $\sum_j \sum_i M_{ij}$ Total imports of the other products in the rest of the world.

The analysis of the RTA was carried out in monetary values and positive values of the Vollrath Index (> 0) reveal a competitive advantage in the country “j” for the good “I”, whereas negative values (< 0) reveal a respective competitive disadvantage.

Finally, the Grubel-Lloyd index (Grubel-Lloyd, 1975) was used for analysing the intra-trade structure of fruit and vegetables between Morocco and the main Mediterranean EU partners.

The index is given by the following equation:

$$GLi = \frac{(Xi + Mi) - |Xi - Mi|}{Xi + Mi}$$

where X_i denotes the export, M_i the import of good i . When the index approaches 1, exports are roughly equal to imports, or, in our case, fruit and vegetable trade structure of the country under analysis (e.g. Morocco) tends to be similar to the other country (e.g. EU country). When the index approaches 0, trade flows consist only of imports or exports.

The analysis refers to the time period 2008-2010 and takes into account Morocco and its main European partners in trade of fruits and vegetables: France, Spain and Italy.

In order to estimate the indices previously introduced, the evaluation was conducted using the data on international trade reported in UN Comtrade Harmonised System (HS). The products analyzed in our study were the fresh fruit and vegetable products (four-digit codes) included in codes 07 and 08, reported in Table 1:

| Tab. 1 - Fruit & vegetable products analysed in the paper | | | |
|---|--|---------|--|
| HS code | Products | HS code | Name |
| 0701 | Potatoes, fresh or chilled | 0711 | Vegetables provisionally preserved, not ready to eat |
| 0702 | Tomatoes, fresh or chilled | 0712 | Vegetables, dried, not further prepared |
| 0703 | Onions, shallots, garlic, leeks, etc. fresh or chilled | 0805 | Citrus fruit, fresh or dried |
| 0704 | Cabbage, cauliflower, kohlrabi & kale, fresh, chilled | 0806 | Grapes, fresh or dried |
| 0705 | Lettuce and chicory, fresh or chilled | 0807 | Melons, watermelons and papaws (papayas), fresh |
| 0706 | Carrots, turnips, beetroot, etc. fresh or chilled | 0808 | Apples, pears and quince, fresh |
| 0707 | Cucumbers and gherkins, fresh or chilled | 0809 | Stone fruit, fresh (apricot, cherry, plum, peach, etc) |
| 0708 | Leguminous vegetables, fresh or chilled | 0810 | Fruits nes, fresh |
| 0709 | Vegetables nes, fresh or chilled | 0811 | Fruits and nuts, uncooked, boiled or steamed, frozen |
| 0710 | Vegetables (uncooked, steamed, boiled) frozen | 0813 | Fruit, dried, nes, dried fruit and nut mixtures |

5. Frame of reference: the trade in fruit and vegetables between the EU and Morocco

In the last decade, the overall commodity exchange between the EU and Morocco has been increasingly waning. Nevertheless, the cash balance – constant euro - has decreased by - 553% from -1.8 billion euros in 2000 - 2002 to -11.4 billion euros in 2008 - 2010.

This positive trend was due to developments in the agro-food sector, such that the traffic of these goods between the EU and Morocco amounted to a net export-import increment of more

than 200%, with the average constant-euro value of the trade jumping from 0.58 billion in 2000 - 2002 to 1.65 billion in 2004 - 2007, reaching 1.66 billion euros in 2008 - 2010 (Table 2).

Behind this trend, which has been in favour of Morocco, is the trade in fruit and vegetables, virtually constituting the whole import-export value of all food products. In fact, the EU-Morocco trade in fruit and vegetables as a percentage of all the respective food products went up from 89.8% in 2000 - 2002 to 98.7% in 2008 - 2010.

The overall impact of the current bilateral agreement covering certain types of goods – tomatoes; pulses; melons, watermelons & papayas; citrus; other fresh fruit; various processed fruit – on the sectoral balance of trade from Morocco to the EU has been in continuous decrease from 80.9% in 2000 - 2002 to 80.3% in 2004 - 2007, reaching 76.6% in 2008 – 2010. In the period examined, the largest increases recorded are listed as follows in decreasing order of importance: pulses (487%); melons, watermelons & papayas (354%); tomatoes (240%); various processed fruit (372%); citrus (around 90%); other fresh fruit (around 90%).

Tab. 2 - Breakdown of the import-export balance between Morocco and the European Union for the main fruit & vegetable products over the period of 2000 - 2010

| (Values in '000 euros) (*) | | | | | | | |
|-----------------------------------|---|----------------------|----------------------------|----------------------|----------------------------|----------------------|----------------------------|
| HS code | Products (***) | 2000 - 2002 | | 2004 - 2006 | | 2008 - 2010 | |
| | | Current euros | Constant euros (**) | Current euros | Constant euros (**) | Current euros | Constant euros (**) |
| 0701 | Potatoes | 4.960,37 | 5.973,00 | 7.617,28 | 8.514,07 | 3.628,13 | 3.837,10 |
| | | 100 | 100 | 154 | 143 | 73 | 64 |
| 0702 | Tomatoes | 118.467,79 | 140.899,52 | 232.133,17 | 254.016,99 | 473.146,36 | 479.285,60 |
| | | 100 | 100 | 196 | 180 | 399 | 340 |
| 0703 | Onions, shallots, garlic, leeks, etc. | 806,82 | 939,15 | 255,49 | 282,65 | -2.024,26 | -2.029,02 |
| | | 100 | 100 | 32 | 30 | -251 | -216 |
| 0704 | Cabbage, cauliflower, kohlrabi & kale | 330,43 | 368,23 | 2.638,12 | 2.850,34 | 3.749,39 | 3.815,06 |
| | | 100 | 100 | 798 | 774 | 1.135 | 1.036 |
| 0705 | Lettuce and chicory | 119,50 | 140,89 | 2.299,15 | 2.503,79 | 4.050,62 | 4.107,29 |
| | | 100 | 100 | 1.924 | 1.777 | 3.390 | 2.915 |
| 0706 | Carrots, turnips, beetroot, etc. | 929,62 | 1.132,59 | 611,53 | 661,62 | 4.228,04 | 4.291,53 |
| | | 100 | 100 | 66 | 58 | 455 | 379 |
| 0707 | Cucumbers & gherkins | 2.241,86 | 2.633,30 | 4.624,43 | 5.040,07 | 4.881,99 | 4.952,50 |
| | | 100 | 100 | 206 | 191 | 218 | 188 |
| 0708 | Leguminous vegetables | 39.375,92 | 46.845,81 | 177.203,81 | 193.745,82 | 271.509,28 | 275.039,45 |
| | | 100 | 100 | 450 | 414 | 690 | 587 |
| 0709 | Nes, fresh or chilled vegetables | 29.557,94 | 35.117,46 | 129.903,05 | 141.938,17 | 252.965,72 | 256.410,22 |
| | | 100 | 100 | 439 | 404 | 856 | 730 |
| 0710 | Uncooked, steamed or boiled frozen vegetables | 3.048,44 | 3.635,91 | 4.750,63 | 5.216,80 | 3.735,41 | 3.785,66 |
| | | 100 | 100 | 156 | 143 | 123 | 104 |
| 0711 | Provisionally preserved vegetables | 14.160,78 | 16.846,59 | 16.512,55 | 18.067,88 | 26.336,89 | 26.713,13 |
| | | 100 | 100 | 117 | 107 | 186 | 159 |
| 0712 | Dried vegetables without preparation | 815,80 | 982,93 | 113,85 | 126,08 | 927,38 | 944,60 |
| | | 100 | 100 | 14 | 13 | 114 | 96 |
| 0805 | Citrus | 120.731,52 | 144.183,65 | 214.152,21 | 234.623,35 | 266.770,41 | 270.545,05 |
| | | 100 | 100 | 177 | 163 | 221 | 188 |

| HS code | Products (***) | 2000 - 2002 | | 2004 - 2006 | | 2008 - 2010 | |
|---------|--|----------------|---------------------|------------------|---------------------|------------------|---------------------|
| | | Current euros | Constant euros (**) | Current euros | Constant euros (**) | Current euros | Constant euros (**) |
| 0806 | Grapes | 2.149,37 | 2.546,57 | 19.564,91 | 21.416,96 | 26.921,51 | 27.293,39 |
| | | 100 | 100 | 910 | 841 | 1.253 | 1.072 |
| 0807 | Melons, watermelons & papaws | 19.072,34 | 22.697,15 | 71.268,27 | 77.816,11 | 101.539,99 | 102.941,42 |
| | | 100 | 100 | 374 | 343 | 532 | 454 |
| 0808 | Apples, pears & quince | -2.268,42 | -2.693,27 | -5.131,87 | -5.604,94 | -13.132,03 | -13.285,56 |
| | | 100 | 100 | 226 | 208 | 579 | 493 |
| 0809 | Apricots, cherries, plums, peaches, etc. | 3.381,17 | 4.058,89 | 12.594,23 | 13.800,42 | 13.925,22 | 14.129,38 |
| | | 100 | 100 | 372 | 340 | 412 | 348 |
| 0810 | Nes or fresh fruit | 38.871,14 | 46.159,52 | 68.521,13 | 75.066,26 | 84.777,88 | 85.989,77 |
| | | 100 | 100 | 176 | 163 | 218 | 186 |
| 0811 | Uncooked, boiled or steamed frozen fruit & nuts | 16.820,36 | 20.009,91 | 54.822,95 | 60.099,93 | 92.579,12 | 94.006,32 |
| | | 100 | 100 | 326 | 300 | 550 | 470 |
| 0813 | Dried or nes fruit, and dried fruit & nut mixtures | -144,21 | -169,85 | -378,26 | -415,99 | -334,55 | -337,62 |
| | | 100 | 100 | 262 | 245 | 232 | 199 |
| | Total | 413.099 | 491.940 | 1.014.077 | 1.109.766 | 1.620.183 | 1.642.435 |
| | | 100 | 100 | 245 | 226 | 392 | 334 |
| 07; 08 | Total fruit & vegetables (****) | 448.417 | 519.973 | 1.017.190 | 1.113.232 | 1.620.977 | 1.643.236 |
| | | 100 | 100 | 227 | 214 | 361 | 316 |
| 01-24 | Total agri-food products (*****) | 472.878 | 579.181 | 1.508.795 | 1.655.705 | 1.640.962 | 1.663.854 |
| | | 100 | 100 | 319 | 286 | 347 | 287 |

(*) Source: UN COMTRADE
(**) The values are referred to 2010
(***) The HS code for main fresh fruit and vegetables products are: 0701: Potatoes, fresh or chilled; 0702: Tomatoes, fresh or chilled; 0703: Onions, shallots, garlic, leeks, etc. fresh or chilled; 0704: Cabbage, cauliflower, kohlrabi & kale, fresh, chilled; 0705: Lettuce and chicory, fresh or chilled; 0706: Carrots, turnips, beetroot, etc. fresh or chilled; 0707: Cucumbers and gherkins, fresh or chilled; 0708: Leguminous vegetables, fresh or chilled; 0709: Vegetables nes, fresh or chilled; 0710: Vegetables (uncooked, steamed, boiled) frozen; 0711: Vegetables provisionally preserved, not ready to eat; 0712: Vegetables, dried, not further prepared; 0805: Citrus fruit, fresh or dried; 0806: Grapes, fresh or dried; 0807: Melons, watermelons and papaws (papayas), fresh; 0808: Apples, pears and quince, fresh; 0809: Stone fruit, fresh (apricot, cherry, plum, peach, etc); 0810: Fruits nes, fresh; 0811: Fruits and nuts, uncooked boiled or steamed, frozen; 0813: Fruit, dried, nes, dried fruit and nut mixtures
(****) The fresh fruit and vegetables products include the products of 07 and 08 of Harmonized System Code of UN COMTRADE
(*****) The agri-food products include the commodities from 01 to 24 of Harmonized System Code of UN Comtrade

Products with the highest average trade surplus for Morocco in its exchange of goods with the EU in 2008 - 2010 were as follows: tomatoes (about 479 million euros); pulses (275 million euros); citrus (over 270 million euros); other vegetables (256 million euros); melons, watermelons & papayas (103 million euros). Potatoes was the only product group that has experienced a negative trend with a decrease of 36%.

There has been a negative trade balance in the following types of goods: apples, pears & quince; onions & allium vegetables; mixtures of dried fruit and nuts.

Finally, it should be noted that the trend in current euros of the trade flows examined (see Table 1 above) revealed no differences from what we have already presented in constant euros. This shows that the increase in the value of Moroccan exports of fruit and vegetables depends not only on market fluctuations and the exchange value of the currency, but also on the ability

to penetrate into the EU markets, especially with certain types of products, amongst which: tomatoes; pulses; citrus; other vegetables; apricots, cherries & peaches.

6. Results

These investigations have shown that Morocco has a clear competitive advantage over the EU and its major Mediterranean countries (Spain, France and Italy) in the trade in fruit and vegetables.

Looking at the data for the period of 2008 - 2010 in Table 3, the types of goods in which the EU is more competitive than Morocco are: frozen cooked vegetables; dried vegetables; apples, pears & quince; mixtures of dried fruit and nuts.

Tab. 3 - RCA indices of the bilateral trade between Morocco and the main Mediterranean European countries for fresh fruit & vegetable products over the period of 2008 - 2010 (*)

| HS code | Products | Morocco-EU | | Morocco-France | | Morocco-Spain | | Morocco-Italy | |
|---------|--|--------------------|-------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|
| | | RCA _{MEU} | RCA _{EU} | RCA _{MFR} | RCA _{FRM} | RCA _{MSP} | RCA _{SPM} | RCA _{MIT} | RCA _{ITM} |
| 0701 | Potatoes | 7,80 | 1,96 | 8,71 | 0,72 | 0,30 | - | 0,05 | - |
| 0702 | Tomatoes | 116,09 | - | 84,07 | - | 20,12 | - | 4,23 | - |
| 0703 | Onions, shallots, garlic, leeks, etc. | 2,40 | 1,52 | 0,65 | 0,09 | 0,52 | 5,91 | 0,16 | - |
| 0704 | Cabbage, cauliflower, kohlrabi & kale | 6,44 | 1,65 | 0,09 | 4,57 | 0,18 | - | - | - |
| 0705 | Lettuce & chicory | 18,27 | 1,96 | 2,31 | 1,53 | 0,01 | 5,80 | 1,38 | - |
| 0706 | Carrots, turnips, beetroot, etc. | 14,77 | 1,96 | 0,93 | 6,71 | 0,25 | - | - | - |
| 0707 | Cucumbers & gherkins | 8,39 | - | 1,92 | - | 9,54 | - | 0,48 | - |
| 0708 | Leguminous vegetables | 51,29 | 0,02 | 36,23 | 0,06 | 70,79 | - | 0,89 | - |
| 0709 | Nes, fresh or chilled vegetables | 19,25 | 1,78 | 11,27 | 0,79 | 15,17 | 4,24 | 0,83 | 0,03 |
| 0710 | Uncooked, steamed or boiled frozen vegetables | 0,84 | 1,88 | 0,31 | 0,31 | 0,03 | 1,46 | - | 0,99 |
| 0711 | Vegetables provisionally preserved | 24,50 | 1,40 | 4,26 | 0,00 | 40,62 | 5,38 | 60,30 | 0,24 |
| 0712 | Dired vegetables without further preparation | 0,20 | 0,73 | 0,47 | 1,38 | 0,33 | 0,49 | 0,26 | 0,01 |
| 0805 | Citrus | 14,82 | 1,53 | 5,35 | 4,10 | 2,39 | 1,32 | 0,18 | - |
| 0806 | Grapes | 0,84 | 0,12 | 0,83 | 0,01 | 0,60 | 0,04 | 9,39 | 0,92 |
| 0807 | Melons, watermelons & papaws | 16,27 | 0,01 | 24,98 | - | 5,19 | 0,04 | 5,74 | 0,04 |
| 0808 | Apples, pears & quince | 0,08 | 1,49 | 0,26 | 1,11 | - | 1,56 | - | 5,49 |
| 0809 | Apricots, cherries, plums, peaches, etc. | 2,40 | 1,08 | 2,20 | 0,05 | 3,76 | 4,02 | 0,54 | 0,49 |
| 0810 | Nes or fresh fruit | 7,67 | 1,61 | 5,45 | 0,09 | 6,34 | 2,29 | - | 7,93 |
| 0811 | Uncooked boiled or steamed frozen fruit & nuts | 9,35 | 1,72 | 5,92 | 0,44 | 35,32 | 3,44 | 13,99 | - |
| 0813 | Dried or nes fruit, and dried fruit & nut mixtures | 0,05 | 0,11 | 0,02 | 0,35 | 0,13 | 0,03 | - | - |

(*) Source: see Table 2

In comparison to individual EU Mediterranean countries, Morocco has more ability to compete in the trade in fruit and vegetables, continuing to gain market segments even within the EU countries bordering the Mediterranean Sea which are historical exporters of these goods.

Morocco has a dominant position even when it comes to overall world markets, as evidenced by the Vollrath-RTA-index values that are, in fact, consistently higher than those initially calculated for the EU with the RCA index of Kumar and Mathur. The most significant types of goods for which Morocco holds a position of leadership in the world market, much higher than that of the Community, and therefore also of those European countries⁶ on the north shore of the Mediterranean, as reported in Table 4 are as follows: tomatoes, pulses; preserved vegetables; other vegetables; melons, watermelons & papayas; citrus; and others to a lesser extent.

Tab. 4 - RTA indices of Morocco and the main Mediterranean European countries for fresh fruit & vegetable products over the period of 2008 - 2010 (*)

| HS code | Products | Morocco | EU | France | Spain | Italy |
|---------|--|--------------|--------------|--------------|--------------|--------------|
| | | RTA Vollrath |
| 0701 | Potatoes | -1,53 | 1,01 | 4,29 | -0,89 | -0,94 |
| 0702 | Tomatoes | 42,17 | -0,18 | -0,66 | 10,28 | 0,47 |
| 0703 | Onions, shallots, garlic, leeks, etc. | 0,10 | -0,11 | -0,22 | 2,90 | -0,26 |
| 0704 | Cabbage, cauliflower, kohlrabi & kale | 0,36 | 0,49 | 1,33 | 14,34 | 2,07 |
| 0705 | Lettuce & chicory | 0,68 | 0,36 | 0,12 | 24,80 | 1,91 |
| 0706 | Carrots, turnips, beetroot, etc. | 2,17 | 0,16 | -0,61 | 3,45 | 2,83 |
| 0707 | Cucumbers & gherkins | 0,80 | 0,08 | -0,71 | 21,64 | -0,08 |
| 0708 | Leguminous vegetables | 149,89 | -5,67 | -0,54 | -1,32 | -0,77 |
| 0709 | Nes, fresh or chilled vegetables | 8,51 | -0,15 | -1,17 | 10,96 | 0,29 |
| 0710 | Uncooked, steamed or boiled frozen vegetables | 0,33 | -0,13 | -1,15 | 2,74 | -1,13 |
| 0711 | Provisionally preserved vegetables | 38,64 | -2,11 | -1,36 | 3,19 | -4,82 |
| 0712 | Dried vegetables without preparation | 0,22 | -1,19 | -0,36 | 0,55 | -0,75 |
| 0805 | Citrus | 34,07 | -0,99 | -2,28 | 27,52 | -0,25 |
| 0806 | Grapes | 1,48 | -1,76 | -0,63 | 1,41 | 2,94 |
| 0807 | Melons, watermelons & papaws | 14,75 | -1,16 | -1,24 | 12,92 | 0,20 |
| 0808 | Apples, pears & quince | -0,37 | -0,23 | 1,41 | -0,23 | 3,08 |
| 0809 | Apricots, cherries, plums, peaches, etc. | 1,28 | 0,13 | 0,31 | 18,19 | 3,85 |
| 0810 | Nes or fresh fruit | 4,08 | -0,33 | -0,95 | 6,97 | 1,65 |
| 0811 | Uncooked boiled or steamed frozen fruit & nuts | 12,55 | -1,78 | -2,32 | 0,41 | -0,36 |
| 0813 | Dried or nes fruit, and dried fruit & nut mixtures | -0,16 | -1,72 | 0,62 | -0,00 | 0,29 |

(*) Source: see Table 2

Among the latter, Spain is indeed an exception for certain types of goods for which it maintains a favourable competitive position. Amongst these are: onions & allium vegetables; cabbages & products of brassica genus; lettuce & chicory; carrots & beetroot; cucumbers & gherkins; apricots, cherries & peaches.

⁶ Russia is one of the main non-EU importers of Moroccan fruit and vegetable products (about 14%).

Results of Grubel-Lloyd indices are reported in Table 5. Fruit and vegetable trade between Morocco and its main European partners showed on the whole, an absence of intra-industry trade, except for a few cases such as “Potatoes” and “Apple, pears & quince” between Morocco and France or “Dried vegetables without further preparation” between Morocco/France and Morocco/Spain. No intra-industry trade has been revealed between Morocco and Italy.

Tab. 5 - Grubel-Lloyd indices of the intra-industry trade between Morocco and the main Mediterranean European countries

| HS Code | Products | Morocco vs UE | Morocco vs France | Morocco vs Spain | Morocco vs Italy |
|---------|--|---------------|-------------------|------------------|------------------|
| 0702 | Potatoes | 0,76 | 0,46 | 0,02 | 0,00 |
| 0703 | Tomatoes | 0,00 | 0,00 | 0,00 | 0,00 |
| 0704 | Onions, shallots, garlic, leeks, etc. | 0,81 | 0,14 | 0,17 | 0,00 |
| 0705 | Cabbage, cauliflower, kohlrabi & kale | 0,01 | 0,18 | 0,00 | 0,00 |
| 0706 | Lettuce & chicory | 0,07 | 0,06 | 0,09 | 0,00 |
| 0707 | Carrots, turnips, beetroot, etc. | 0,01 | 0,05 | 0,00 | 0,00 |
| 0708 | Cucumbers & gherkins | 0,01 | 0,00 | 0,00 | 0,00 |
| 0709 | Leguminous vegetables | 0,00 | 0,00 | 0,00 | 0,00 |
| 0710 | Nes, fresh or chilled vegetables | 0,01 | 0,00 | 0,01 | 0,00 |
| 0711 | Uncooked, steamed or boiled frozen vegetables | 0,22 | 0,01 | 0,50 | 0,00 |
| 0712 | Vegetables provisionally preserved | 0,04 | 0,00 | 0,04 | 0,00 |
| 0805 | Dried vegetables without further preparation | 0,57 | 0,74 | 0,84 | 0,04 |
| 0806 | Citrus | 0,00 | 0,00 | 0,00 | 0,00 |
| 0807 | Grapes | 0,09 | 0,01 | 0,12 | 0,30 |
| 0808 | Melons, watermelons & papaws | 0,00 | 0,00 | 0,00 | 0,00 |
| 0809 | Apples, pears & quince | 0,02 | 0,84 | 0,02 | 0,00 |
| 0810 | Apricots, cherries, plums, peaches, etc. | 0,07 | 0,00 | 0,28 | 0,23 |
| 0811 | Nes or fresh fruit | 0,04 | 0,00 | 0,10 | 0,00 |
| 0813 | Uncooked boiled or steamed frozen fruit & nuts | 0,01 | 0,00 | 0,01 | 0,00 |
| 0813 | Dried or nes fruit, and dried fruit & nut mixtures | 0,19 | 0,25 | 0,89 | 0,00 |

(*) Source: see Table 2

7. Discussion and policy implications

Empirical analysis has revealed Morocco’s dominant competitive position not only in the EU fruit and vegetable market but also at global level.

This advantage may become even greater in the perspective of a new bilateral agreement between the EU and Morocco, causing instability in the EU, especially in regions suitable for fruit and vegetable production. These imbalances include the following:

- Further increases in imports of Moroccan fruit and vegetables;
- Conflicts concerning food safety, environmental protection and other similar issues;
- Loss of employment and incomes in the EU regions where fruit and vegetables are traditionally produced.

Apart from the natural and climatic factors that certainly favour Morocco, the causes of

these imbalances can be traced back to a number of factors that enable lower pricing for Moroccan fruit and vegetables. One example is the low production costs, particularly for labour. The minimum wage in Morocco is known to range around 4.64 euros/day (Ministère de la Prevision Economique, Maroc, 2010), which is way below the levels generally applicable in different regions of EU agricultural production. In addition, the Moroccan producers are not subject to the strict environmental and phytosanitary regulations of the EU (e.g., compliance rules, nitrates directives, etc.). In the past, this has caused conflict among the institutions involved in marketing fruit and vegetables, and thus led to complaints about the EU's inability to gather useful information on Moroccan products before they are exported to Member States⁷. In this way there is a risk of turning the comparatively low constraints Moroccan producers face in terms of food security, environmental protection and other similar aspects into a competitive advantage over the EU producers.

Even the Moroccan commercial organizations are different from the European ones: in Morocco they are supported by financial oligarchies and centrally coordinated lobbies (e.g., EAC-CE)⁸, whose task is to constantly guide and direct exporters, informing them about the best channels through which their exports can be directed in a given period of the marketing year.

Finally, the growing dominance of Morocco in its bilateral trade with the EU implies the risk that thousands of European fruit and vegetable companies will disappear, unless a process of possible conversion into more competitive products is initiated, or countervailing action is undertaken to support the EU territories that are no longer able to compete with products coming from Morocco and other Mediterranean countries.

8. Conclusions

In this study Morocco's competitive advantage over the EU in the fruit and vegetable sector has been examined to verify whether the degree of competitiveness has become significant enough to be addressed appropriately through a strategic approach in a new bilateral agreement between the EU and Morocco.

Using the RCA approach proposed by Mathur and Kumar, the evaluation of trade showed an increasing specialization in the commercial flows from Morocco to EU Member States with regard to the following categories of products, listed in decreasing order by quantity: tomatoes; pulses; preserved vegetables; other vegetables; lettuce & chicory; melons, watermelons & papayas; citrus.

Using the Vollrath RTA index, the competitive position of Morocco for fruit and vegetables was also examined with regard to the global international market, revealing an even stronger position than that in the EU market where it enjoys a preferential trading partner status with reference to the aforementioned fruit and vegetables.

Finally, empirical evidence has highlighted, using the Grubel-Lloyd index, no similarity of factor endowments for fruit and vegetable production and consequently a predominant inter-industry trade between Morocco and its main Mediterranean EU partners. According to traditional theories on international trade, this result probably means a different availability of factor

⁷ For this reason, a modification in art. 139 of Regulation (EC) 1580/2007 "laying down implementing rules of Council regulations (EC) n. 2200/96, (EC) n. 2201/96 e (EC) n. 1182/2007 for fruit and vegetables sector" has recently been requested.

⁸ Etablissement Autonome de Contrôle et de Coordination des Exportations.

endowments such as labour or land in favour of Morocco or a greater efficiency of the Moroccan fruit and vegetable sector.

Despite the importance of the EU's current border-protection system in supporting its fruit and vegetable sector, the differences in competitiveness revealed may also point to the inadequacy of the constraints of the EU policy, especially given the natural conditions and level of labour cost that differentiate the commercial positioning of Morocco on the international scene.

However, an important aspect to take into account is the specificity of the demand in developed countries, where consumers – while giving particular importance to the wide selection of fruit and vegetables with their respective appeal – want appropriate guarantees in food production concerning issues of safety, environment pollution, and last but not least, quality.

On the other hand, participation with quality products expresses an element of competition when quality is part of the same circuit of evaluation and consumer recognition and this subsequently contributes to reduction of the asymmetry in information, giving a more significant competitive advantage to European farmers.

In future, policies on Euro-Mediterranean cooperation should take into account the very deep integration between the two shores of the Mediterranean through appropriate instruments in the framework of the Association Agreements on the aspects discussed above.

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EVALUATION OF SUSTAINABLE ACCOUNTING PRACTICES IN THE ITALIAN BIOENERGY SECTOR

JEL classification: Q01

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Abstract. *Bioenergy is a vital component of the energy sector in Italy, contributing to the country's commitment for reduction in green house gas emission and enhancing its selfreliance on energy production. At the same time, however, there are risks that the bioenergy sector may generate negative impacts on the environment and society, if it is not properly managed. Sustainable accounting is one of the important instruments by which, through stakeholder pressure, responsible actions by organizations can be enforced. For this reason it is necessary to develop better sustainable accounting practices, to report and to address the concerns over the sustainability of the bioenergy sector in order to avoid detrimental results masked as renewable energy. In addressing the above needs, the aim of this research is to evaluate current sustainable accounting practices in the Italian Bioenergy sector and to construct a conceptual framework for enhanced sustainable accounting practices. This research begins with an analysis of*

a few small and medium Italian bioenergy enterprises as regards their current accounting practices for sustainability using the content analysis method to identify the gaps in reporting. In this step, a considerable lack of reporting about the environmental and social impacts has been identified in a sample of small-and-medium-sized firms in the wood biomass sector. Based on the above findings, the study then develops a conceptual framework to fill the gap identified, with due consideration of the practical limitations for the companies to adopt it. The basis of this framework is the regulatory framework of the European Union and sector-specific selective indicators have been proposed for use. This set of indicators, providing information on bioenergy's sustainability impacts, will render a better picture of the company's action for the stakeholders.

Keywords: *Sustainable Accounting, Sustainable Biomass, SME, Italian Bioenergy, Environmental Indicators, Social Indicators.*

1. Introduction

Energy has always been an essential component of the human system, enabling a better lifestyle and today, in the modern world, it is more so than ever. The European Commission states that “energy is at the heart of everybody’s quality of life and a crucial factor for economic competitiveness and employment” (European Commission, 2010). Demand for energy is growing across the globe, widening the gap between supply and demand, increasing the cost of energy and energy poverty. In 2010, the total production of primary energy, the gross domestic consump-

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tion of primary energy and energy dependence (% of net imports in gross domestic consumption) in Italy are 30.19 Mtoe (million tons of oil equivalent), 175.52Mtoe and 83.78% respectively (Eurostat, 2010). This clearly shows that Italy has a huge gap between domestic supply and demand and depends heavily on imports for energy. Hence, Italy needs to increase its domestic production of energy in order to reduce the risk of price volatility and of potential energy disruptions due to energy import dependency.

Due to its commitment to address global warming by reducing carbon dioxide emissions, Italy needs to prioritize its focus on renewable energy systems in the process of increasing local energy production. The European Commission's recent study 'Energy Roadmap 2050' states that renewable energy must contribute at least 55 % of gross final energy consumption of member states by 2050, in order to meet its commitment to reduce greenhouse gas emissions to 80–95 % below 1990 levels (European Commission, 2012). The directive 2009/28/EC promoting the use of renewable energy, which sets a target of 17% of final energy consumption through renewable sources by 2020, has been adopted by Italy. Although the share of renewable energy in gross final energy consumption in 2009 is only 8.9% (Eurostat, 2010), bioenergy is one of the important renewable energy resources in Italy which has been in use for a long time. The above-mentioned Directive, along with the new incentives adopted for electricity in Italy, provide a good opportunity for growth of the bioenergy sector (Pignatelli *et al.*, 2011). Primary renewable energy produced through biomass and renewable wastes in 2010 is 6.09 Mtoe (Eurostat, 2010) where it has been estimated by the ITABIA (Italian Biomass Association) that it has a potential to grow to the range of 24 - 30 Mtoe (Pignatelli *et al.*, 2011).

A United Nations (UN) report states that “without access to sustainable energy, there can be no sustainable development” (UN, 2012). In order to emphasize and promote the importance of sustainable energy, the UN has announced 2012 as the 'International Year of Sustainable Energy for All'. Addressing the obstacles in the path of reaching the objectives, Ban Ki-moon, the Secretary-General of the UN states that “achieving sustainable energy for all is an ambitious but achievable goal” (UN, 2011). Bioenergy can be an important source of sustainable energy; it can create many positive impacts (for example: CO₂ reduction, job creation, local growth, etc) along with providing energy, but it can also create negative impacts (for example: conflict with food security, indirect emissions, local opposition, etc.) if it is not properly managed. This makes it necessary that sustainable bioenergy systems be balanced between economic, social and environmental systems because it is in our best interest to produce energy that allows us and future generations to enjoy a better quality of life. This is only achievable by reconciling investors' interest and sustainability in the process of creating energy. Those individuals who invest in energy creation must pay attention to value maximization over a long period through sustainability rather than focusing on easy earning strategies in the short term.

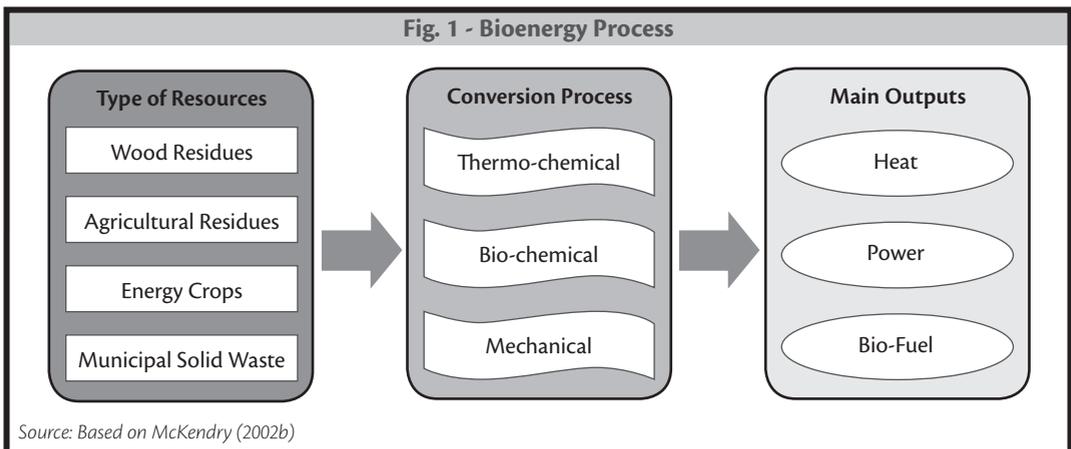
Reporting is one of the tools used by organizations to engage with various stakeholders, and is also a resource for creating pressure on activities of the organizations involved. Corporations need accountability mechanisms which are able to recognize stewardship for the resources entrusted to them (Gray and Guthrie, 2007) and to demonstrate and raise the trustworthiness as a part of a reputation-building process (Owen *et al.*, 2001). Sustainable accounting practices providing information on positive and negative impacts of the companies, can provide a complete picture of the company to the stakeholders. That can create pressure on the companies to act and enhance their sustainable performance for the future. In order to achieve and manage sustainable bioenergy it is important that companies account for their environmental and social performance along with their financial performance. The UN vision statement for 'sustainable energy for all'

also emphasizes the need to develop supportive policies and regulatory frameworks that can ensure social and environmental sustainability in the energy industry (UN, 2011).

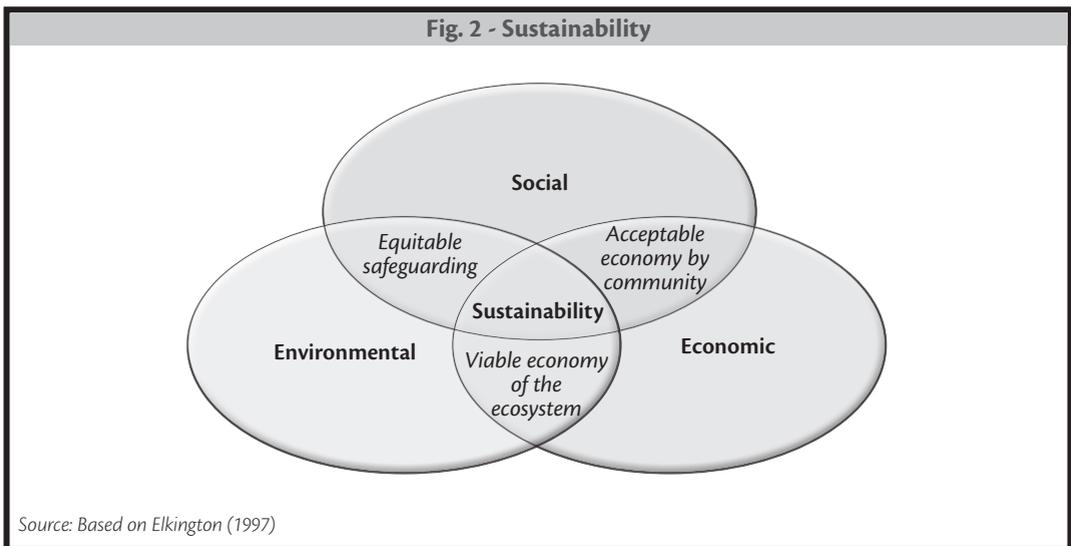
Given its importance for bioenergy sustainability and the need for the sustainability reporting framework, this research evaluates the current sustainable accounting practices in Italian bioenergy sector and develops a conceptual framework for sustainable accounting of bioenergy companies. This, in turn, can be used as a means for improving the sustainable performance of the organizations due to its public exposure. In addressing the aim of this research, the article is structured as follows: it reviews bioenergy sustainability and sustainable accounting practices in Italy in the second and third sections below respectively. There follows, in the fourth section, an analysis of the current sustainability accounting practices of a sample of Italian bioenergy companies. A conceptual framework to fill the gap is identified in section five and in section six the conclusions are presented.

2. Sustainable bioenergy

The Food and Agriculture Organization of the United Nations (FAO) defines bioenergy as “all energy derived from biofuels”; biofuels as “fuel[s] produced directly or indirectly from biomass” and biomass as “material of biological origin excluding material embedded in geological formations and transformed to fossil” (FAO, 2004). Biomass resources can be divided into four groups; wood residues, agricultural residues, energy crops and municipal solid waste (Easterly and Burnham, 1996). Wood residues are generated from wood products industries. Agricultural residues are generated by crops, agro-industries and animal farms. Energy crops are crops and trees dedicated to energy production. Municipal solid waste is the waste generated by households and the general public: it contains both degradable and non-degradable wastes. Biomass can be converted into three main forms of energy products namely heat, power or transport fuels. These energy products can be formed by different conversion processes from biomass to energy. Three main categories of conversion processes are thermo-chemical, bio-chemical / biological and mechanical. Thermo-chemical conversion of biomass to energy can be carried out through combustion, pyrolysis, gasification and liquefaction processes. Bio-chemical conversion consists of two main processes namely digestion and fermentation. Extraction is the mechanical process used for the conversion (McKendry, 2002b). These process associations are shown below (Figure 1):



Sustainable development is described more commonly by the definition of the Brundtland Commission (WCED, 1987), “sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs.” According to Adams (2006), sustainability requires the reconciliation of environmental, social and economic demands, which are known as the ‘three pillars’ of sustainability. Dyllick and Hockerts (2002) also argue that corporate sustainability can be seen as three components, which need to be met in order to achieve sustainability: business case (economic), the natural case (environmental) and the societal case (social). Integration of these three components is also required by the ‘triple bottom line’ model proposed by Elkington (1997). These considerations are illustrated summarily in Figure 2:



Alongside these studies, Boyle *et al.* (2003) describe sustainability in the context of energy as energy sources which are not substantially depleted by regular usage, not polluting nor creating other hazards to the environment in major scale, not involving any social injustice or health hazards to people. In the context of bioenergy the European Biomass Association (AEBIOM) defines sustainability as “a production and utilization of biomass without harming nature – water, soils, biodiversity, the carbon stock of biomass - and maintaining the capability of nature to produce biomass in a permanent way in the future (AEBIOM, 2010).”

Biomass-based power generation can contribute to significant reductions in greenhouse gas emissions, along with greater potential for positive impacts. Escobar *et al.* (2009, p. 1286) states that “the fight against hunger in the world goes through the sustainable development of rural regions, which would allow access to jobs and income for millions of people. Programs aiming at growing oleaginous plants and the production of bio-fuels could contribute towards this fight, mainly in degraded areas.” International Energy Agency (IEA, 2007, p. 4) supports this by stating, “biomass can be important for using marginal land and bringing socio-economic benefits in those (under developed) regions.”

At the same time, there are concerns about some of the economic, environmental and social

aspects of bioenergy such as ‘operating and investment cost’ (Thornley *et al.*, 2009), ‘efficient use of natural resources’ (Rovere *et al.*, 2010), ‘impacts on food production’ (Escobar *et al.*, 2009), ‘amount of land and water use’ (Evans *et al.*, 2010), ‘energy crops grown using high amounts of fertilizers’ (Evans *et al.*, 2010), ‘appropriate working conditions and decent remuneration for workers’ (Escobar *et al.*, 2009) and ‘lack of benefits for smallholders’ (Schlegel *et al.*, 2007). Therefore, in order to understand the complete picture of these operations, it becomes important to assess and account bioenergy systems not only using technical and economic factors but also using environmental and social parameters.

3. Sustainability accounting

“The use of accounts is a method of avoiding the stigma of an accusation of (...) deviance” (Abercrombie *et al.*, 1984, p. 13). Because these deviances are not always economic but can also be environmental and social, accounting is required for all deviances. In order to achieve this, sustainability accounting has been proposed to report on an organization’s economic, social and environmental impacts (Lamberton, 2005). The Global Reporting Initiative (GRI, 2011), describes the process of reporting for sustainability by companies as “the practice of measuring, disclosing, and being accountable to internal and external stakeholders for organizational performance towards the goal of sustainable development.” An integrated system of social, environmental and economic disclosures could “improve the social and environmental performance of companies and represents the instrument *par excellence* for managing stakeholder relations... as such, it is a concrete manifestation of a company’s commitment to transparency” (Kaptein, 2007, p. 72). In fact, through all “forms of accounts which go beyond the economic” (Gray 2002, p. 687), business organizations could legitimate their activities (Hogner 1982; Hopwood 2009) and users could assess whether the entity is socially, financially and environmentally responsible (Gray and Guthrie 2007).

Concerning the information about social and environmental impact, the principal laws should guarantee procedural fairness and transparency and avoidance of the phenomenon of expropriation of resources which belong to all the stakeholders involved in a system. In Italy, the financial statements of companies which do not adopt international accounting standards particularly for the balance sheet (art. 2424 Civil Code) and for the income statement (art. 2425 Civil Code), the law does not require disclosure of precise information about social and environmental impact on the public. The notes to the financial statement (art. 2427 Civil Code) explain the values of the documents cited with the purpose of giving a true and correct representation of the situation of a company from the economic and financial points of view, as well as of its assets. There is neither a special section nor supplementary information on social and environmental impacts. Instead, in the management report (art. 2428, sub-paragraph 1 and 2, Civil Code), qualitative information is given, but not in detail, for sustainable aspects and without a specific framework to follow as regards the environmental and social impacts. In this report, management must make an analysis about the situation of the company and trends in different sectors in which it is operating. They look at costs, revenue and investments, and a description of the principal risks and uncertainties to which the company is exposed. This analysis should be more detailed in order to give an understanding of each company’s situation, management trends and results. This would require disclosure of financial and non-financial indicators, including

information on the environmental and personnel and an estimate of value created or destroyed for the community³.

In order to reinforce the community's perception and to disclose information about the physical environment, annual reports may be used to demonstrate management's responsiveness to environmental issues and to answer the stakeholders' demand for information (Wilmshurst and Frost, 2000). The information reported in annual reports is regarded with a high degree of credibility (Tilt, 1994); this resource could be a main form of corporate communication (Adams and Harte, 1998) also for disclosing environmental information (Deegan and Rankin, 1997). However these annual reports are not able to cover aspects that occur over a long period of time and that "may result in a somewhat incomplete picture of disclosure practices" (Roberts, 1991, p. 63; Unerman, 2000). In fact, previous studies have demonstrated that environmental information in annual reports is often incomplete: the available data does not reveal the effect of business activity on natural resources, for example, in terms of the amount, timing, or uncertainty of future cash flows (Harte and Owen, 1991; Deegan and Gordon, 1996).

To address these gaps, firms need to collect and disclose information related to the organization's impact on the physical environment (pollution), consumer relations, human resources, community involvement, energy conservation, worker safety, worker health, and product safety (Epstein and Freedman, 1994; Mathews and Perera, 1995). Companies should consider a range of information from financial to "a combination of quantified non-financial information and descriptive, non-quantified information" (Gray, 2000, p. 250), to be disclosed through several communication tools.

If the annual report is the main communication for disclosing financial information, as argued before, then other tools could be used by firms to report their socially responsible behavior. In addition to social and environmental reports, media such as web sites, press releases, advertisements, corporate brochures should produce social and environmental information that is able to influence stakeholder opinion (Unerman, 2000; Unerman and Bennett, 2004; Thomson and Bebbington, 2005; Adams and Frost, 2006). In particular, considering that internet increases the velocity of the public relations process, facilitating two-way interaction, through its speed of dissemination, access and feedback, it could be argued that it is the main facilitator of corporate communicative action (Sikka, 2006). The internet is also a low cost direct communication channel, however, it must be noted that its use could be prevented by barriers in the form of limited access to new technologies (Pinterits and Treiblmaier, 2006).

4. Empirical analysis

As discussed above accounting for sustainability which requires the disclosure of social and environmental information can create public pressure on companies to act in a correct way; such disclosure is important for the bioenergy sector due to its characteristics and the possible consequences of improper management in this sector. For example, the sector is heavily dependent on the consumption of raw material. If raw material is not available in sufficient quantity locally to satisfy market demand, there can be over-exploitation of available forests, with

³ So for the unlisted companies which draw up the financial statement in an abbreviated form (art.2435-bis Civil Code), which does not include the management report, there is no specific information about environment and personnel.

danger to the natural environment or to the import of raw materials from abroad, generating an increase in transport-related costs and pollution. Hence the analysis of the selected sample of companies is carried out in order to understand the present situation about accounting for sustainability and also the availability of information to the companies involved in the wood biomass sector in Italy.

Content analysis method is used to identify the state of accounting for sustainability and environmental and social disclosure practices. Content analysis is defined as “a research technique for making replicable and valid inferences from data to their context” (Krippendorff, 1980). Content analysis is a method of codifying text or content of a piece of writing into various groups or categories depending on selected criteria (Weber, 1988). This method involves the construction of a classification scheme (defining a set of boxes into which to put the data) and developing a set of rules about “what” and “how” to code, measure and record the data to be classified (Milne and Adler, 1999). In this study the investigation is carried out in the dimensions related to environment, energy, products/consumers, community, employee/human resources and fair business practices, exposed through monetary and non-monetary quantification or declaration.

We have selected four enterprises operating in the wood biomass sector which are case studies in a national project (dated 2010) promoted by ENAMA (national agricultural mechanization association). Our sample is formed by non listed companies (small and medium-sized enterprises) in the wood biomass sector. The purpose of this examination is to present the principal information of companies that adopt the national accounting standards which are declared in the abbreviated form (in 3 of the cases analysed) and in the normal form of the financial statement 2010 (only one case of our sample). We only consider joint stock companies because they are obliged to draw up a financial statement which can be in the ordinary or in the abbreviated form. Disclosures in the financial statement, stand-alone reports (in particular, reports available on the ENAMA web site) and company web pages are examined. The focus of the analysis is on environmental and social impact disclosures. In particular, after examination of economic and financial information in the financial statement, the analysis (on the ENAMA on-line documents and web site) is concentrated on the following topics: energy consumption, solid waste disposal and recycling, air emissions, materials and water consumption, transportation, employment generation and other sustainability issues of bio-energy. The first step of our analysis is concentrated on the information disclosed in the financial statement (31/12/2010) (Table 1); this is organized according to the main topics required by national law. Only one company had a management report where they gave a little information about employees, salaries and their working conditions; and some description of environmental impact. In notes to the financial statement, business descriptions have been provided by two companies and the number of jobs by one company. It can be seen very clearly from the Table 1 that not enough information has been provided for environmental and social impacts by the companies analyzed.

Tab. 1 - Financial Statement Information

| Category | Information | Type of information | Case study 1 | Case study 2 | Case study 3 | Case study 4 |
|----------------------------------|--|---------------------|------------------------------|--------------|------------------------------|------------------------------|
| Balance sheet | - Total non-current assets | Quantitative | x | x | x | x |
| | - Total current assets | Quantitative | x | x | x | x |
| | - Total equity | Quantitative | x | x | x | x |
| | - Total non-current liabilities | Quantitative | x | x | x | x |
| | - Total current liabilities | Quantitative | x | x | x | x |
| Income statement | - Revenue | Quantitative | x | x | x | x |
| | - Profit | Quantitative | x | x | x | x |
| | - Personnel costs | Quantitative | x | x | x | x |
| Notes to the financial statement | - Business description | Qualitative | x | | x | |
| | - Number of people employed by category | Quantitative | | x | | |
| | - Turnover employee | Quantitative | x | | | |
| | - Personnel costs by professional profile | Quantitative | | x | x | |
| | - Analytical costs of raw materials and services | Quantitative | | | x | |
| Management report | - Economic and financial Index analysis | Quantitative | not required by national law | x | not required by national law | not required by national law |
| | - Operating profit | Quantitative | | x | | |
| | - Research and development projects | Qualitative | | x | | |
| | - Number of people employed by category and gender | Quantitative | | x | | |
| | - Accidents at work | Qualitative | | x | | |
| | - Respect for environmental system | Qualitative | | x | | |

Source: From original survey data

In the second step of our analysis we focused on economic, environmental and social information on these case studies available in any other stand alone report (we find some reports of these companies in the ENAMA web site) (Table 2). The purpose of the analysis is to identify the information disclosed and to highlight the type and nature of voluntary information disclosed by the sample firms. We aggregated several topics into categories of information required by the European framework, in order to easily recognize and compare the different information available in these documents. Some of the information required by the European framework for bioenergy sustainability has been disclosed in these reports, but not all. Information is not provided uniformly by all the organizations: there is a difference in the type and depth of information disclosed.

Tab. 2 - Information on case studies available in ENAMA (update in 2010)

| Category | Information | Type of information | Case study 1 | Case study 2 | Case study 3 | Case study 4 |
|--------------------------------|--|---------------------|--------------|--------------|--------------|--------------|
| Environmental | - Land used for bio energy (type, wood grown) | Quantitative | x | x | | x |
| | - Co2 avoided | Quantitative | | x | x | |
| | - Waste management | Qualitative | | | x | |
| | - Replaced methane | Quantitative | | x | | |
| Socio-economic | - Human resources employed | Quantitative | | x | | |
| Governance | - Framework regulatory | Qualitative | x | x | x | x |
| | - Type of incentives | Qualitative | x | | x | |
| | - Amount of incentives | Quantitative | | | x | |
| Economical | - Cost/benefit analysis | Quantitative | x | | x | |
| | - Payback period | Quantitative | x | | x | x |
| Energy | - Thermal energy and electricity production | Quantitative | x | x | x | x |
| | - Energy for internal use in % | Quantitative | | | x | |
| | - Thermal energy and electricity destination | Qualitative | x | x | x | x |
| Information about Raw material | - Type of raw material | Qualitative | x | x | x | x |
| | - Suppliers and their locations | Qualitative | x | | | x |
| | - Origin of raw material | Qualitative | x | x | x | x |
| | - Characteristics (humidity, calorific value, etc....) | Quantitative | x | x | x | x |
| | - Distance travel led by raw material | Quantitative | | | x | |
| | - Raw material costs | Quantitative | | x | x | x |
| | - Average consumption | Quantitative | x | x | x | x |
| Process Information | - Type of technology | Qualitative | x | x | x | x |
| | - Year of implementation | Quantitative | x | x | x | x |
| | - Cost related to each activity (during the process) | Quantitative | | x | | x |
| | - Supply chain information | Qualitative | | x | x | |
| Other information | - Ownership | Qualitative | x | x | x | x |
| | - Partners | Qualitative | x | x | x | x |

Source: From original survey data

The third step is the analysis of websites to determine whether the sample firms disclose voluntary information on this “facilitator of corporate communicative action”. The findings show that this communication tool is not used by all the firms and most of the information is not updated (Table 3).

Tab. 3 - Sustainability information on internet

| Category | Information | Type of information | Case study 1 | Case study 2* | Case study 3 | Case study 4 |
|---|----------------------------|---------------------|--------------|---------------|---------------|--------------|
| Web information | - Raw material location | Quantitative | x | | Not available | Not active |
| | - Type of raw material | Quantitative | x | x | | |
| | - Raw material growth | Qualitative | | x | | |
| | - Raw material details | Quantitative | | x | | |
| | - Co2 saved | Quantitative | x | | | |
| | - System type | Quantitative | x | | | |
| | - System capacity | Quantitative | x | x | | |
| | - Operational efficiency | Quantitative | x | | | |
| | - Impact on landscape | Quantitative | x | | | |
| | - Supply chain information | Quantitative | x | | | |
| * Information is updated to 2009 Source: From original survey data | | | | | | |

This analysis shows that information disclosed from different sources is incoherent. The GRI's sustainability reporting guidelines (2011) states that sustainability reporting, "should provide a balanced and reasonable representation of the sustainability performance of a reporting organization – including both positive and negative contributions". But the current reporting elements do not provide much information on its negative impacts. With the current practices of the firms as regards the collection and disclosure of social and environmental information, it is not possible to assess correctly their impact on society and stakeholder's opinion.

5. The conceptual framework

The belief that "if the quality of (sustainability) information is improved, organizational change toward sustainability will occur" (Lamberton, 2005, p. 13) is the driving force behind the proposal aimed at increasing the transparency of organizations' social and environmental impacts through sustainability accounting practices. But the above assessment clearly shows that the current practices of disclosure are not fit for the purpose. The level of disclosures can be influenced by corporate size (Cho and Patten, 2007; Patten, 2002), regulation designed to protect the social and environmental interests (Porter and van der Linde, 1995; Neu *et al.*, 1998), industry (Gray *et al.*, 2001) and the country of origin of a company (Guthrie and Parker 1990; Roberts 1991; Adams, Hill *et al.* 1998), as well as social and political context (Burchell *et al.*, 1985; Adams and Harte, 1998).

In this study the 'small and medium size' (SME's) of the Bioenergy companies is one of the important reasons behind the above findings of inadequate disclosures. SME's constitute a big share in the Italian economy. SME's collective impact on the economy, society and environment is vast, due to the immediate influence that a small business has on the local environment and community (Roth 1982). In particular, the role of SME's in the Italian business context in terms of the country's balance of trade, their environmental contribution to industrial pollution and their impact on the society is relevant. In 2010, there were 669 bioenergy plants in Italy with an

average size of plant of 3.5Mw and gross maximum capacity of 2352 Mw (GSE, 2011). These small and medium size plants contribute significantly in Italy's Bioenergy portfolio. However, these SME's face challenges due to budgetary and human resource limitations. These limitations make it difficult for them to implement an environmental management system to report the impact of their activities on natural resources (Seiffert, 2008) - not only the environmental but in fact all sustainable impact disclosures are difficult for these organizations.

At the same time, the measurement of sustainability is not an easy task "sustainability, being a multi-dimensional concept, is not directly measurable and requires a set of indicators to enable performance toward its multiple objectives to be assessed" (Lamberton, 2005, p. 13). There are different sustainability frameworks available such as GRI (Global Reporting Initiative) which provide different objectives and their indicators to be measured for the sustainability impact. But again these initiatives have a large number of indicators which are difficult for SME's to measure and these indicators are not business and context specific which again hinders the application.

Starting from these considerations, in order to develop sustainable accounting practices (which in turn will impact on the operating practices) for the small and medium bioenergy enterprises, in this section of the research a set of sustainable objectives and indicators is proposed. The Directive 2009/28/EC of the European Union (European Commission, 2009) recognized a regulatory framework with a set of sustainability criteria for biofuels and bioliquids, but it can be also adopted for bioenergy because of the growing concerns about the sector. This EU framework relates mainly only to the three environmental aspects (biodiversity, the protection of ecosystems and savings in greenhouse gas emission) but at the same time, concerning other aspects of sustainability, the European Union requires the Commission to report to the EU Parliament on a few other aspects (FAO, 2010). Therefore, in the intention of creating an easy (usable) and effective (measuring the essential) disclosure framework, the reporting requirements of the Commission together with the regulatory framework can be seen as the minimum to be revealed by companies. They define the important social and environmental information to be disclosed in addition to the financial statement of the non-listed companies which are involved in the production of energy through biomass.

A sustainability reporting framework for the bioenergy sector based on Directive 2009/28/EC of the European Union (European Commission, 2009), Bioenergy and Food Security Criteria and Indicators - BEFSCI (FAO, 2010), Global Bioenergy Partnership (GBEP, 2011) and the Global Reporting Initiative (GRI, 2011) is suggested here (Table 4).

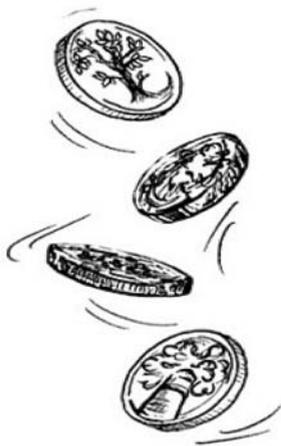
Tab. 4 - Sustainability Reporting Framework

| | Objectives | Indicators |
|----------------|--|---|
| ENVIRONMENTAL | Land-use changes (both direct and indirect) | <ul style="list-style-type: none"> - Total area of land for bioenergy feedstock production (GBEP, 2011) - Percentages of bioenergy from residues and wastes (GBEP, 2011) - Percentages of bioenergy from degraded or contaminated land (GBEP, 2011) - Net annual rates of land-use types conversion caused directly by bioenergy feedstock production (GBEP, 2011) |
| | Biodiversity and ecosystem services | <ul style="list-style-type: none"> - EN11 Location and size of land owned, leased, managed in, or adjacent to, protected areas and areas of high biodiversity value outside protected areas (GRI, 2011) - EN12 Description of significant impacts of activities, products, and services on biodiversity in protected areas and areas of high biodiversity value outside protected areas (GRI, 2011) |
| | Productive capacity of land | <ul style="list-style-type: none"> - EN1 – Raw Materials used by weight or volume. (ton/Mw) (GRI, 2011) - Annual harvest of wood resources by volume of an area (GBEP, 2011) - The percentage of the annual harvest used for bioenergy (GBEP, 2011) |
| | Water availability and quality | <ul style="list-style-type: none"> - Volume of water withdrawn and used for the production and processing of bioenergy feedstock per unit of useful bioenergy output, disaggregated into renewable and non-renewable water sources (GBEP, 2011) - Percentage of pollutant loadings from total agricultural (biomass) production in the watershed(GBEP, 2011) - Pollutant loadings to waterways and bodies of water attributable to bioenergy processing effluents in percentage (GBEP, 2011) |
| | GHG emissions | <ul style="list-style-type: none"> - EN16 Total direct and indirect greenhouse gas emissions by weight/Mw (GRI, 2011) - EN18 Initiatives to reduce greenhouse gas emissions and reductions achieved (GRI, 2011) |
| | Air quality | <ul style="list-style-type: none"> - EN19 Emissions of ozone-depleting substances by weight (GRI, 2011) - EN20 NO, SO, and other significant air emissions by type and weight (GRI, 2011) |
| | Waste management | <ul style="list-style-type: none"> - Percentages of bioenergy produced from residues and wastes (GBEP, 2011) |
| | Environmental sustainability (cross-cutting) | <ul style="list-style-type: none"> - EN29 Significant environmental impacts of transporting products and other goods and materials used for the organization's operations, and transporting members of the workforce (GRI, 2011) - EN30 Total environmental protection expenditures and investments by type (GRI, 2011) |
| SOCIO-ECONOMIC | Land tenure/ access and displacement | <ul style="list-style-type: none"> - Amount of raw material sourced outside of Italy in percentage - Percentage of land – total and by land-use type – used for new bioenergy production where: a legal instrument or domestic authority establishes title and procedures for change of title and it is followed up (GBEP, 2011) |
| | Employment, wages and labour conditions | <ul style="list-style-type: none"> - LA1 Total workforce by employment type, employment contract, and region, broken down by gender (GRI, 2011) - LA2 Total number and rate of new employee hired and employee turnover by age group, gender, and region (GRI, 2011) - Incidences of occupational injury, illness and fatalities in the production of bioenergy in relation to comparable sectors (GBEP, 2011) |
| | Social sustainability (cross-cutting) | <ul style="list-style-type: none"> - SO1 Percentage of operations with implemented local community engagement, impact assessments, and development programs (GRI, 2011) - SO9 Operations with significant potential or actual negative impacts on local communities (GRI, 2011) - EC1 Direct economic value generated and distributed, including revenues, operating costs, employee compensation, donations and other community investments, retained earnings, and payments to capital providers and governments (GRI, 2011) |

| | Objectives | Indicators |
|------------|--------------------------------|--|
| GOVERNANCE | Compliance | Mainly applicable to the Information disclosed at Member State Level but still: - EN28 Monetary value of significant fines and total number of non-monetary sanctions for noncompliance with - Any other issues of compliance with laws and regulations |
| | Participation and transparency | Mainly applicable to the Information disclosed at Member State Level but still: - Providing sustainable information's. - EC4 Significant financial assistance received from government (GRI, 2011) - SO6 Total value of financial and in-kind contributions to political parties, politicians, and related institutions by country (GRI, 2011) - SO5 Public policy positions and participation in public policy development and lobbying (GRI, 2011) |
| FOOD | Food availability | Mainly applicable to the Information disclosed at Member State Level only: - Reporting on availability of foodstuffs at affordable prices (FAO, 2010) |
| | Food access | Mainly applicable to the Information disclosed at Member State Level only: - Corrective actions taken if evidence shows that if there is a significant impact on food prices (FAO, 2010) - Changes of commodity and land prices associated with increased use of biomass (FAO, 2010) |

Source: Own analysis drawing on Directive 2009/28/EC (2009), BEFSCI (FAO, 2010), GBEP (2011), GRI (2011)

Fig. 3 - The two sides of bioenergy coins



Source: F. Casciotti (2012)

In this framework the objectives are based on the Directive 2009/28/EC of the European Union (European Commission, 2009) as categorised by Bioenergy and Food Security Criteria and Indicators (BEFSCI) (FAO, 2010). Some of the objectives information required by the European Union is national / regional level information rather than from individual companies, which is mentioned in the framework (Governance, Food section). For other objectives than those, the appropriate indicators are suggested mainly using Global Bioenergy Partnership (GBEP, 2011), Global Reporting Initiative (GRI, 2011) and Bioenergy and Food Security Criteria and Indicators – BEFSCI (FAO, 2010). The information to be disclosed can be quantitative or even qualitative sometimes because

“qualitative tools, such as narratives used to describe an organization’s social and environmental impacts form a critical part of sustainability accounting” (Lamberton, 2005, p. 14).

This framework can help to understand the real operative situation of the companies in this sector from different points of view, providing a balanced representation of the sustainability performance with positive and negative impacts. In future, through proper social and environmental information, the evaluation of the companies’ positive and negative externalities could be better estimated. Indeed, such externalities, if quantified, could be considered in order to recalculate the principal economic indicators using an operating profit corrected by those externalities to disclose the real sustainable results of the companies. For example, ratios which represent the

performance in term of economic and financial results as ROE (return on equity), ROI (return on investment), ROS (return on sales), ROA (return on assets) or EVA (economic value added) could be recalculated with a sustainable operating profit given by adding the positive externalities and subtracting the negative externalities to /from the operating profit outcome of the financial statement⁴.

6. Conclusions

Bioenergy is a significant source of energy for Italy and can play a major role in Italy's drive for increasing domestic energy production and reducing green house gas emissions. At the same time bioenergy can create negative impacts on the environment and society and betray its moral value, if it is not properly managed. This could result in rendering the notion of 'sustainable bioenergy' as an illusion rather than a reality, as is depicted in *Figure 3*, which shows the two (positive and negative) sides of bioenergy. Hence, it is important to understand these harmful effects in order to avoid a detrimental process which damages the community and expropriates wealth economically, socially and environmentally. This demands proper accounting for sustainability in the bioenergy sector, because only when the right information is disclosed by companies involved in bioenergy is it possible to understand the real value added by it. These disclosures can play a significant and legitimate role in responding to the questions of sustainability put forward by the society.

The empirical analysis ascertains the gap in reporting of information about wider sustainability, in the financial statement and in other voluntary documents of the small and medium bioenergy enterprises. These organizations nevertheless account for a huge share of the bioenergy business in Italy and negligence of the overall impact can cause serious damage to the environment and society in long run. The disclosure should integrate different points of view and different exigencies such as the view of the entrepreneurs, controlling shareholders, subjects who use the services provided by such companies, community and of the collectivity in general. It is necessary to have information about the policy of the company and facts that it is not destroying the environment and society. An accounting framework reporting the sustainability of bioenergy has been suggested with due consideration of the limitations of the SME's and the minimum necessary information.

The Directive 2009/28/EC of the European Union on renewable energy has been considered as the basic regulatory requirement for this framework and the indicators are recommended mostly from the Food Security Criteria and Indicators, Global Bioenergy Partnership and the Global Reporting Initiative. The EU regulation has four main themes namely environment, socio-economic, governance and food security. While most of the indicators for the objectives are selected with the consideration of practical applicability and relevance in addressing the objective, some of the objectives are wider in scope and require information disclosure at regional or national level.

This framework provides a suitable starting point for organisations to report on sustainability on a voluntary basis. However further research is require to compose a comprehensible list of data requirements for these indicators, to develop measurement techniques for them, to build up

⁴ By such changes, a new formulation of these ratios is possible: SROE (sustainable return on equity), SROI (sustainable return on investment), SROS (sustainable return on sales), SROA (sustainable return on assets) or SEVA (sustainable economic value added).

a strategy for their practical application and to study their implications, all of which are identified as research gaps in this field during the study.

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THE EVOLUTIVE PROCESS OF EUROPEAN AGRICULTURAL RESEARCH POLICIES AND KEY STRATEGIES FOR DEVELOPMENT

JEL classification: I23, O32, O38

Francesco Zecca*

Abstract. *The world is changing quickly and dramatically, bringing a range of challenges to European agriculture, including climate change, impact on the environment, pressures on natural resources, increasing competition and demographic changes. Therefore, Agricultural research (AR) is being asked to address issues that are both multi- and interdisciplinary: convergence of knowledge from different disciplines is important to achieve a better understanding of these complex and interlinked problems.*

The aim of this paper is to analyse the framework of European Agricultural Research activities (mechanisms, policies, strategies) and to reflect on how to further implement the Lisbon key concept of making EU the most dynamic and competitive knowledge based economy in the world. In this knowledge based economy, research and scientific innovation will be

the drivers for human wellness and health and, therefore, research within agribusiness sector and nutrition will have an increasing role in this strategy.

The remarks in the first section of the paper are the starting point for the analysis in the following sections and intend to summarize the present literature at European Community level.

The statements expressed are compared with the current framework of agricultural research and supported by the investigation on the evolutionary process.

On the basis of these premises, the present paper could be considered as a first contribution to the debate that could be developed at national and local level on themes related to the objectives of improving the European Agricultural Research System.

Keywords: agriculture, research, policies

1. European agricultural research: definition and scope

A general consensus exists at international level on what agricultural research (AR) encompasses, even if some stakeholders may put different emphasis on different components.

Agricultural research is a key element of the “Agricultural Knowledge System”, together with Education and Innovation to create the “Knowledge Triangle”¹ in the area of agriculture and related fields.

Clearly, AR is multi-dimensional in addressing all the agricultural challenges.

The agricultural domain includes:

- crop production and animal husbandry;

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¹ The Conference on “The Knowledge Triangle: shaping the future of Europe” held in Goteborg on 31 August-2 September 2009, focused on the importance of a well functioning knowledge triangle (education, research, innovation) for Europe in a situation where the European Union (EU) Research and Education system is perceived as fragmented, and called for intensified interaction between policy areas, notably for higher education, research and innovation.

- agro-forestry;
- fisheries and aquaculture;
- agribusiness and related enterprises;
- animal and human health related issues;
- sustainable management of natural resources
- socio-cultural impact
- bio-diversity

AR aims to provide innovation on technological and socio-economic issues to contribute to a sustainable development.

AR is intrinsically:

- fundamental & applied – dealing with upstream and problem- solving research;
- comprehensive – dealing potentially with research objectives in any field and at any relevant scale, thus encompassing a wide range of scientific disciplines (from molecular biology or genetics to agro-ecosystem management, economics of international trade, political science or modelling of complexity);
- multi-stakeholder – because the people concerned are many and face a variety of specific and often little-known situations, thus requiring iterative and inter-active loops of participatory diagnosis to research product processes that include all players and activities of the local innovation systems;
- global – as similar problems are widely shared among countries and as local interactions with world problems result from globalizations
- multiple policy-oriented – because it contributes to various and different policies: research policies, international relation and trade, development cooperation policies, rural and agricultural policies, health policy, to mention the most important ones for AR.

For the EU, as said, AR intervention area is part of Knowledge-Based Bio-Economy (KBBE) as it is tightly related to all the European challenges and priorities adressed and the relevant exploitation of biological resources in agri -business activities.

2. The European agricultural research: players, mechanisms and policies

2.1. Agricultural research mechanisms and players

There are many important players influencing and animating agriculture research at European level.

The main players and mechanisms have been identified in the following Table 1:

| Tab. 1 - Planning procedures and players in agricultural research | | |
|--|--|--|
| Level | EAR for EU | EAR for Developing Countries |
| National level | | |
| Players | Min. Health, Min. Agric. Nat. research institutes. | Min. Health, Min. Agric., Min. Foreign Affairs; |
| Planning procedure | Inter-ministerial processes; National Agricultural Research Organisations and Universities | Inter-ministerial processes; National Agricultural research Organisations and Universities |
| National-to-European and vice-versa | | |
| Players | Min. Sc.; Min Agric.; and National delegations to FP7 Programme Committee | National delegations to FP7 Programme Committee; EIARD; ERA-ARD; ECARTEEIG; NATURA |
| Planning Procedure | National coordination mechanisms for input in the European programmes | Meetings and reports |
| European level | | |
| Players | DG-Res.; DG-Agric.; EP; MS; SCAR; European Research Council; European Science Foundation; | DG-Res.; DG-Dev.; DG-AidCo; EP; MS; GFAR and its regional fora; Global Donor Platform; |
| Planning Procedure | Programme Committee FP7; consultations; conferences; Technology Platforms; European calls. | Programme Committee FP7; consultations, conferences; FSTP; EDF10 |
| Source: FP 7 2007 – 2013 - Seventh Framework Programme on R&D, European Commission | | |

The high number of actors and procedures involved affects the process of setting up and implementing the European Agricultural Research System.

While the number of actors involved creates a critical mass and ensures representation of each public institution, an effective involvement of farmers, agro-industries and consumers is not equally guaranteed. Their involvement is critical in the research process for testing upcoming innovations

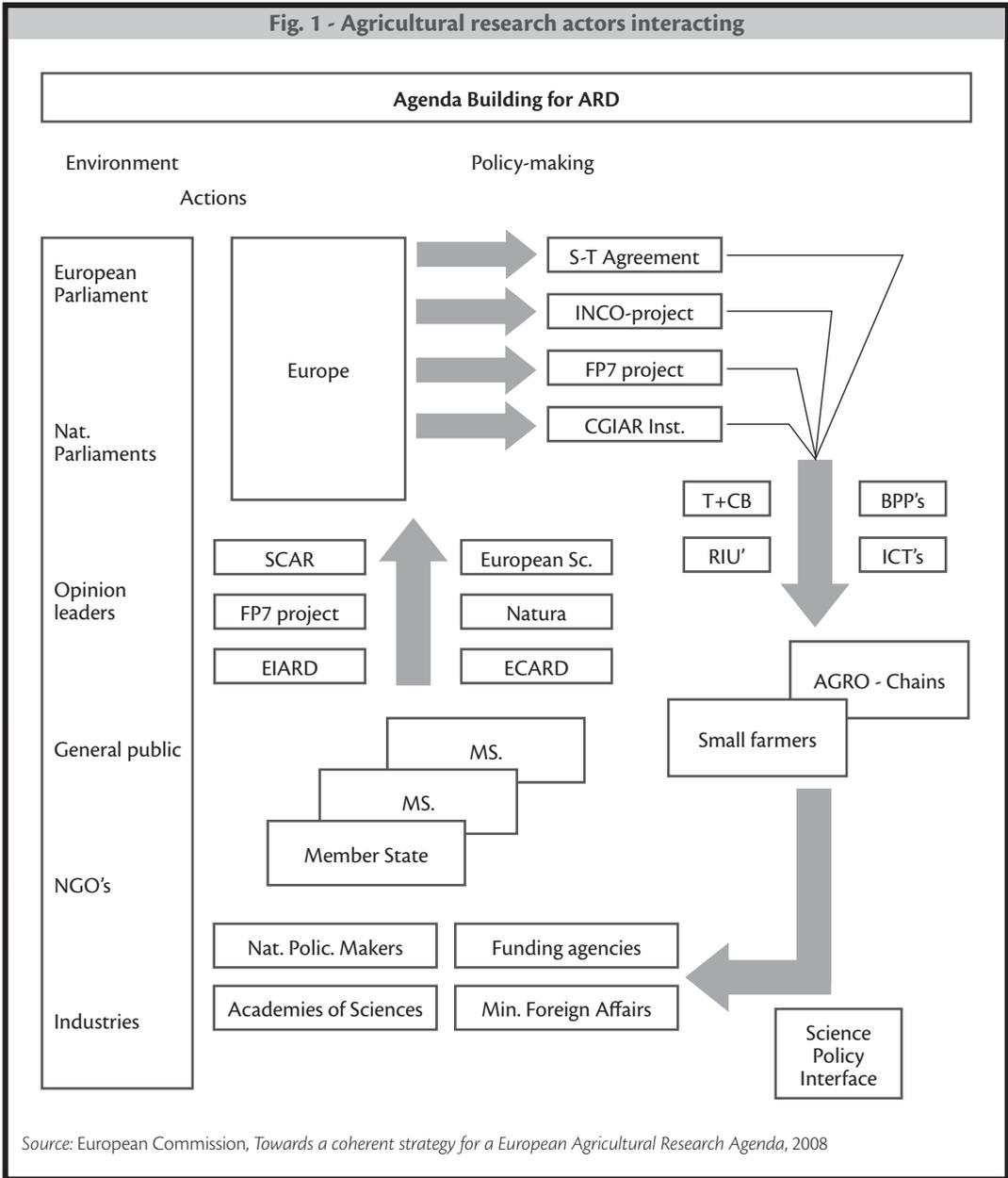
Furthermore, contrasts often emerge in identifying research issues as players influence the process in terms of the different research priorities supported.

A further consideration in the operation of European agricultural research can be made with regard to transaction costs and knowledge-cycle time.

Concerning the first point, the presence of numerous players has a negative impact on transaction costs along the supply chain of research.

The period of knowledge cycle from a research agenda to a revised research agenda is very long and for this reason it is impossible to respond quickly to the new research questions as they arise.

The following figure describes how the several actors indicated interact:



Analysis of the previous figures shows how the main barriers which delay the European Agricultural Research mechanism arise from several different sources:

- the very high number of subjects dealing with research and innovation;
- the high risk of gaps and overlaps in research programmes and projects;
- research programmes often not linked to real needs;
- researchers and extension services acting in different "environments";

and using different technical languages;

- a lack of structures or pathways to bridge the gap between them;
- no common rationale for data bases of research institutions;
- no transparency in the agenda-building process nor full participation of stakeholders in it.

Concerning the last critical point, a very large number of players are involved in the agenda-setting process, especially in the early phases. It is then very difficult to understand these processes and to know how to effectively participate. In the report on the public consultation on the Green paper (EC, 2008), this problem has been recognised and the reduction to a very limited number of persons has been suggested (high level officials of EU, Ministers of Agriculture, etc.). However, it seems difficult to put this into operation.

2.2. Agricultural research policies

At policy level, the overarching “barrier” is that European AR has different policy objectives or at least different policy priorities.

The different policy objectives depend on the following two types of motivation for research:

- science or **research** policy tends to see innovation as a linear process from basic research to commercial application;
- **development** policy focuses on interaction between different **stakeholders** in the process.

The different approach to research policies is reflected in the programmes and priorities implemented by the European Union. The policies based on the combination of science / research are associated with programmes such Horizon 2020, FP7 and Joint Programming Initiatives.

The policies based on the stakeholder approach are the Common Agricultural Policy(CAP), the Leader programme, the European Technology Platforms.

The lack of integration between those who conceive innovation and those who will gain benefits from the same innovation is quite evident. The big change in the upcoming new programming period is the aim to fill this gap.

The European Commission(EC) has developed the Europe 2020 strategy that states as its objective the creation of an smart, sustainable and inclusive EU economy.

In this policy frame, Horizon 2020 will be the new financing programme for research and development innovation projects and will replace in 2013 the 7FP. The linkage between stakeholder and research environment is enhanced in the legal proposal of the Commission for the upcoming Common Agricultural Policy: it recognises the importance of research in addressing the challenges faced by European farmers and the central role of the Agricultural Knowledge System. Amongst other measures, the EC proposal to reinforce the link between research and practical farming is the creation of an European Innovation Partnership(EIP) for agricultural productivity and sustainability. The EIP is supposed to be the new instrument to facilitate the flow of information between research and practice.

Nowadays, the difficulties faced deal with the various obstacles to the implementation of the agricultural research agenda at all institutional levels.

The insufficient coordination between ministries in charge of national policies and programmes related to AR, the freedom and inherent dynamics within European AR institutions to set up their own research agenda, the significantly different AR priorities (see Tab.1) and the different funding mechanisms for AR are all reflected at the national level.

The insufficient coordination between EC DGs in charge of EU policies and programmes related to AR, the insufficient coordination between coordination mechanisms of European policies and programmes related to AR, the weak communication about commonalities at policy level (EP, European Council), the difficulties in building partnerships between scientists in AR for European agriculture to access EC funds in particular FP7, due to the complexity of the procedures are reflected at the European level(see Tab.2). All this often cause “independent planning”.

Tab. 2 - Thematic priorities for EU-14²

| | BG | HR | CY | CZ | EE | HU | LV | LT | MT | PL | RO | SK | SL | TR |
|--|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| Plant breeding and biotechnology | * | | | * | | | | | | * | | * | * | |
| Crop production and protection | * | | * | | * | * | | | | * | | | | |
| Forestry, forest resources | | | * | * | | * | * | | | * | | * | * | |
| Biodiversity | | * | | * | | * | | | * | * | * | * | * | |
| Animal resources and breeding | * | * | * | * | | * | | | | * | | * | * | |
| Animal production incl.fish | | | | * | | * | * | | | | | * | * | * |
| Animal health and welfare | | | | * | | * | | | | * | | | | |
| Agro Food biotechnology | | * | | | | * | | | | * | * | * | | |
| Natural resources, Environment | | * | * | * | * | * | * | * | | * | * | * | * | |
| Alternative use of agricultural production | | | * | * | * | * | | * | | * | * | * | * | |
| Agricultural technology | | | | * | | * | | | | * | | * | | |
| Food technology | | * | | * | * | * | | * | | * | | * | | |
| Healthy nutrition | | * | | * | * | * | | | | * | * | | | |
| Organic agriculture | * | * | | * | * | * | * | | | * | * | * | * | * |
| Rural development | * | * | | * | * | | * | * | | * | | * | | |

Source: EU AGRI-MAPPING Sixth Framework Programme 2000 – 2006

Regarding the monitoring and evaluation of agricultural research, the following main barriers have been identified:

- criteria used to evaluate scientists as well as national and European AR programmes and projects are not the same: from one case to another they give greater emphasis to “scientific excellence” or to “development relevance”;
- lack of accepted common methodologies for monitoring and evaluation of the outcome of AR.

² EU-14= New EU member States since 2004 and 2007 plus Turkey and Croatia (candidate States)

Overall, research projects do not fully meet the requirements corresponding with the EC definition (EC, 2004):

- a project is a series of activities aimed at bringing about clearly specified objectives within a defined time period and with a defined budget.
- a project should also have:
 - Clearly identified stakeholders, including the primary target group and the final beneficiaries;
 - Clearly defined coordination, management and financing arrangements;
 - A monitoring and evaluation system (to support performance management);
 - An appropriate level of financial and economic analysis, which indicates that the project's benefits will exceed its costs.

Tab. 3 - Obstacles to the support of an agricultural research system for EU Countries

| Country | Sources of public funding | Obstacles |
|-------------|---|---|
| France | Agencies, Ministries, Regional governments | Logic of tenders limits the innovation abilities of the team |
| Finland | Centre of expertise programme, Regional centre programme | Authorities have difficulty in accepting innovative initiatives |
| Italy | Agencies, Ministries, Regional governments | Quality of project implementation is weak |
| Netherlands | Ministry of Agriculture, separate budget for research and applied research. | Institutional barriers such as financial coordination of public funding |
| Germany | Ministries, Regional governments | Budgetary constraints, insufficient investment in capacity building |
| Latvia | National and EU programmes | Fragmentation in programmes. Lack of coordination |

Source: based on Proost M.D.C, Brunori G., Bourdin D., Knickel K.,2008;

Agricultural research projects are involved in a broad area of work represented by programmes defining as a package projects with a common focus or platform or set of priorities for the formulation, funding and implementation of projects.

3. The evolution of European agricultural research

In 2006 SCAR³ (Steering Committee on Agricultural Research) recommended foresight methods and processes in identifying the long-term research priorities.

As a result, the European Commission established a Foresight Expert Group (FEG). The major task of the expert group was to review the available foresight studies relating to the eight “major driving forces”, which were to be considered together in the formulation of four scenarios of the evolution of the agro-food system.

The analysis of these major driving forces and their possible interactions led to the identifica-

³ The Standing Committee on Agricultural Research (SCAR) was established by Regulation (EEC)No.1728/74 of the Council of 27 June 1974 on the coordination of agricultural research, to advise the Commission, especially DG Agriculture. At the end of 2004 SCAR was transferred to DG Research and took on a major role in coordinating agricultural and food research in Europe.

tion of four future scenarios (Climate shock, Energy crisis, Food crisis, Cooperation with nature) summarised in a paper presented at the EU conference Towards Future Challenges of Agriculture Research in Europe in June 2007.

The SCAR Foresight Experts Group considered that a major hurdle in making the transition to a knowledge-based bio-economy was the growing challenge of knowledge failures and the fact that European agricultural research is currently not delivering the type of knowledge needed by end-users in rural communities. New systems of education and knowledge diffusion are needed considering the implications for education of the shift from engineering, physical and mechanical sciences to “converging technologies” (nano, info, bio, etc.). Related to these needs, knowledge exchange strategies and policies already set up in some EU member states need to be formalised and to acquire a higher profile at the EU level and good practice ought to be shared with other member states.

The overview of emerging global trends, policy developments, challenges and prospects for European agri-futures, indicate the need of a new strategic framework for research planning and delivery articulated in four broad lines of action and a fifth cross-cutting theme:

- the sustainability challenge: facing climate change in the knowledge-based bio-society;
- the security challenge: safeguarding European food, rural, energy, biodiversity and agri futures;
- the knowledge challenge: user-oriented knowledge development and exchange strategies;
- the competitiveness challenge: positioning Europe in agri-food and other agri lead markets;
- the cross-cutting theme: policy and institutional challenges facing policy-makers in synchronising multi-level policies.

The SCAR Foresight Experts Group formulated a list of recommendations as follows:

1. The emerging trends highlight the need for coordinated EU, national and regional policy responses to a range of challenges, affecting the world rural agri-economy, as a result of the growing inter-related impacts of climate change, environment, energy and food supply concerns and the shift to a knowledge-based bio-society.

The predominant effects of climate change and the potentially high impact of climate instability on agriculture and the biosphere, will continue to challenge the balance of basic agricultural functions in specific regions, exacerbating, in some cases, regional differences. Multilevel European actions, addressing agriculture and rural development challenges thus need to reflect a coherent, mutually reinforcing and yet flexible approach, tailored to the realities faced in different European regions.

2. The complex, dynamic inter-connection and challenges will entail re-designing the institutional framework for research and putting in place a two-track approach for agri-futures research: a transition research agenda combined with a more long-term high-tech research agenda.
3. To raise the capacity of rural regions to generate, absorb and integrate research developments into economic growth, a regionally-focused, demand-driven approach to research and innovation needs to be developed.
4. For rural communities a temporary protectionist strategy (based on the WTO treaty) will be necessary. Taking into account the results of the foresight studies, there is a clear concern about the way Europe sustains its Agricultural Knowledge System. In particular the Education and Innovation pillars of this system need to be urgently re-thought and improved.

The result of the whole foresight process undertaken by SCAR provided inputs to a report on the coordination of agricultural research in Europe named “Towards a coherent strategy for a

European Research Agenda” that the Commission transmitted to the European Parliament and the Council in 2008.

On this basis, the SCAR launched the second foresight exercise which would provide assessment and alerts on critical developments of agricultural research in the long term.

The 2° foresight panel concluded that the organisation of knowledge, science and technology in the EU was still inadequate to deal with the challenges identified in an integrated way. Insufficient and incomplete documentation exists about the structure, the functions and the relevance of the Agricultural Knowledge System at all levels. Existing documents are related to a relatively few number of European Countries and are incomplete (EC, 2009).

At international level two major drivers are leading the evolution of Agricultural Research:

- the increasing importance of global research issues;
- the increasing importance of research domains for which the distinction between North and South is no longer scientifically valid.

Concerning infrastructures, for AR these are similar in many agricultural research domains, from genomics to GIS (Geographical Information Systems). The research, moreover, is necessary to sustain and develop the Education pillar of the Agricultural Knowledge System.

Different initiatives have been launched on this issue since the beginning of the new millennium: within the 7th Framework Programme (2007-2013), the Commission funds different activities for existing research infrastructures (Support to Transnational Access, European research e-infrastructure, Integrating Activities) and for new research infrastructures (Support to the construction of new infrastructures, Support to design studies).

For new research infrastructures, the approach of the EU Commission is more targeted thanks to the publication of the ESFRI (European Strategy on Research Infrastructures) Roadmap in 2006. This roadmap presents 35 infrastructure projects corresponding to the identified needs for research infrastructures of pan-European interest in all fields of science and technology. However, as agriculture was not included, the EC has been stimulated to identify the future needs of agricultural research and design new models of governance in order to enable the agricultural sector to share efficiently the European infrastructures.

4. Concluding comments

The results of the foresight studies offer an interesting potential for the entire European agricultural research area which imply, inter alia:

- reinforcing fundamental and applied research;
- moving towards the concept of “third generation universities” based on networking and distance learning
- developing multi-scale, interdisciplinary and cross-sectoral approaches to tackle the increasing complexity of European and global challenges;
- working actively with civil society, farmers’ organizations, scientific associations and governments for increased understanding of the implications of global change and to develop shared pathways for mitigation and adaptation;
- balancing research strategies with open knowledge-sharing strategies and innovation (in the sense of bringing research to end-users and into the market).

As a starting point, assuming that decentralised are better than centralised systems in adaptation to change, it is essential to carry out an assessment of the different systems of agricultural research and to identify and modify the locations where centralised decision-making generates rigidity in research and policy-making.

It is also recognised that decentralised adaptation is enhanced by a high-performance information system to support decision-makers with the best data and to enable the construction of new information systems which can really meet the demand of all the stakeholders.

A wide set of data information is crucial in facing the emergence of “one world” research issues, focused on solving issues of common interest for the global community. Economic development and research questions will reach a higher level of integration in the global priorities.

The European Union can play a unique and leading role thanks to its geographical position and succeed in balancing the different agricultural priorities emerging at global level. This also through a strong education and training system.

The evolution of the agricultural research framework, in particular the emergence of the global issues and stronger continental and national capacities, especially in the emerging economy countries (Brazil, India, China, South Africa), requires an even more comprehensive and coordinated approach of European support to international agricultural research at global, continental and southern levels, for the benefit and interest of Europe.

To deal effectively with the emerging global challenges it is important to maintain responsive research systems capable of tackling the complex research questions.

The European Agricultural Research world should promote the common concept of “Global Agricultural Knowledge System” at policy, programme and project levels. In particular, it should encourage an innovation system approach that involves the different public and private actors in the programming, implementation, monitoring and evaluation of agricultural research.

At the same time, the concept of Technology Platforms, which has already been developed for European agricultural research, could also inspire Agriculture Research at international level to play an integrated alert function: moving towards the concept of “third generation universities” based on networking and distance learning could achieve the purpose.

Concerning coordination at policy and programme levels, the need is evident for a policy framework for international science and technology cooperation, in general, and for international Agricultural Research, in particular, to foster and facilitate coherent international agricultural research activities that will benefit the globalised world.

A first step could be that better development cooperation will not suffice to enable the developing countries to reach the MDGs (Millennium Development Goals) and that there is a need for an effective improvement in the coherence of developed countries’ aid and non-aid policies. A second step should be the ongoing reflection on the “Joint Programming” at EU level where the agricultural research area could be selected as one of the few research area priorities.

Science and technology agreements between the Community and third countries also provide a useful framework for international R&T cooperation.

In this sense the Communications on “International science and technology” and on “Towards a coherent strategy for a European Agricultural Research Agenda” and more recently, the paper on the agricultural knowledge and innovation system (EU SCAR, 2012), could provide the policy framework for enlarging the vision of International Agricultural Research.

There is a need to coordinate better and therefore to build coordination interfaces between agricultural and research policies, on the one hand, and external policies, in particular the development and the neighbourhood policies, on the other, at Member State and EC levels. It should

be underlined that this need for policy coherence at EC and Member State levels is not specific to agricultural research but applies to all research sectors (health, environment, energy, ...).

The creation of a permanent inter-service group between the different DGs on agricultural research should be considered.

Member States should consider creating a national coordination body on international agricultural research that would bring together all the different ministries and research institutions involved in agricultural research.

Europe should be more proactive in contributing to defining the global agricultural research agenda in multilateral fora; (FAO, World Bank, UNESCO, OECD, G20, African Union, ASEAN, MERCOSUR) and with the global agricultural research system (GFAR and CGIAR). In that respect, Europe must speak more with one voice, emphasising a small number of high priority global research themes.

Increasing importance should be given to the research infrastructure issue at European level in order to achieve economies of scale and greater efficiency. Increased sharing of European research infrastructures in Member States where this is not fully the case, would foster closer collaborations.

In relation to research infrastructures, Europe should support agricultural research and education platforms in Europe and in partner countries on international agricultural research that would be open to European scientists and students.

There is a need for a better flow of and easy access to information on the different European policies, programmes, funding instruments and opportunities and activities related to agricultural research.

The evaluation of agricultural research at individual, programme and project levels should be improved in order better to balance “scientific excellence” and “research relevance”. This is a key issue but also a very complex one involving:

- increased coherence of national policies on AR;
- support to the establishment of Research-Policy interfaces;
- including the actors in the food chain and civil society in the AR agenda setting process;
- including workers in the food chain and the civil society in the science and technology agenda-setting process;
- the link between research and education should be strengthened;
- Technology Platforms should deal not only with European-centred challenges but also with global challenges;
- the results of scientific research should be better used; this use should be facilitated;
- research-into-use facilities, and knowledge platforms are necessary;
- changes in European policies towards collaborative funding arrangements and cooperation Mechanisms.

In this sense Europe 2020 represents a strategy with potentialities more inclusive than in the past because it is based on a broader and more inclusive conception of the innovation term.

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GLOSSARY

Fig.1

EAR = European Agricultural Research

EU = European Union

Sc. = Sciences

Agric. = Agriculture

Min. = Ministry

FP. = Framework Programme

EIARD = European Initiative for Agricultural Research for Development

ERA- ARD = European Research Area – Agricultural Research for Development

ECARTEEIG = European Consortium for Agricultural Research in the Tropics European Economic Interest Grouping

DG = Directorate General

MS = Member States

SCAR = Steering Committee on Agricultural Research

GFAR = Global Forum on Agricultural Research

EP = European Parliament

FSTP = Food Security Thematic Programme

EDF = European Development Fund

Fig.2

Nat. = National

NGO = Non Governmental Organisation

ST = Science Technologies

INCO = International Cooperation

CGIAR = Consultative Group on International Agricultural Research

EIARD = European Initiative for Agricultural Research for Development

ECARD = European Commission support to Agricultural Research for Development

Sc. = Scientist

SCAR = Steering Committee on Agricultural Research

FP. = Framework Programme

T+CB = Transfer and Capacity Building

BPP = Best Practice Protocol

RIU = Research Into Use

ICT = Information Communication Technologies

MS = Member State

ORGANIZATION AND STRUCTURE OF THE CHAIN IN INTEGRATED PROJECTS FOR THE FOOD CHAIN IN THE REGION OF BASILICATA: THE EFFECTS ON THE NEW RURAL DYNAMICS¹

JEL classification: Q10, Q18

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Abstract. *The introduction of the Integrated Projects for the Food Chain (IPFs) requires the development of models capable of interpreting the dynamics of vertical and horizontal coordination between agents and the definition of the issues that most affect the ability of professionals to provide value added to goods and products to acquire in exchange a competitive advantage. With reference to the Basilicata region, the production structure of the region and the recent development of the Integrated Projects for the Food Chain, this research has developed a new model of territorial organization of rural development.*

To connect a new food chain model that combines theories of productivity, typical of contract economics, with those of social welfare and environmental economics can be crucial: multifunctionality could assume the key role related to the needs of income and efficiency of companies in various stages of the classic food chain, in a context in which planning and consultation are major determinants of local and regional development.

Keywords: *Food Chain, Rural Development, Integrated Project for the Food Chain (IPFs)*

1. Territorial organisation of local development: an introduction

The crucial goal of the Committee on Agriculture and Rural Development of the European Parliament (2010a and 2010b) is to seek a better functioning of the food chain for the adoption of any tools that can improve its operation in order to offer farmers a more equitable level of income, while maintaining affordable prices for consumers. The quality and identity of territorial production, pooled with the need to develop regional and interregional networks, are the main factor of integration and competitive advantage (Contò, 2005, 2010; Gellynck and Kuhne,

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2010) and of rural enhancement (Antonelli, 2010). Thus, the sectoral analysis appears as a kind of micro detail of inputs and outputs (Saccomandi, 1991) carried out upstream and downstream between integrated and specialized firms (Arena *et al.*, 1985). The concept of supply chain becomes a useful reference for the analysis of complex issues related to the production, processing and marketing of products with a view to understanding and analysing the relationships, especially vertical, among segments of production (Contò, 2003); for Malassis (1979) the food system can be considered as a set of interdependent activities, which aim to produce goods that may have different destinations: final consumption, intermediate consumption, or both. The chain² is the route followed by a food product to arrive from the initial stage of production to final use, and the total interactions among all agents involved in this process (Saccomandi, 1986; Pilati, 2004). Starting from these assumptions, the supply chain analysis allows identification of internal and external trading relations undertaken by other branches of agricultural production; the analysis of the supply chain becomes relevant when analyzing the phenomenon of vertical integration (De Muro, 1992), as when connecting two production processes when the output becomes the first input of the second, a development that generates added value. The chain is a system offered on the market that competes with other forms of organization of trade. In this perspective, the centrality of the consumer and fulfilment of expectations are important elements in the behavior of individual companies: this concept is the basis of models of competitive advantage of the value chain (Porter, 1985). The value chain allows us to consider the enterprise as a system, generating activities of value, meaning the price that the consumer is willing to pay for the product which meets their needs. Even in the short supply chain (direct selling, zero kilometer, farmer's markets, etc.), the creation of the final value for the consumer is the result of the connections between the value chain of the farmer and consumer. The use of the concepts of value chain system and the Porter value system permits us to view the industry as an "extended enterprise", with its value chain on the inside confluence of value chains of individual firms (Antonelli, 2010; Parolini, 1996) that refer to a context defined by a network of more connections between economic actors (firms, households, public, various organizations) and final buyers whose co-presence generates a total value which should be read as taking the perspective of the consumer (Contò *et al.*, 2009).

The case of Basilicata Region

The principle of territorial actions dictated by the European Union to the Regions for the execution of Rural Development Programs 2007/2013 met, in Basilicata, a programmatic fragmentation generated in recent years and with reference only to the agri-food sector (rural) of 4 districts and 8 Local Action Groups (LAG).

The District of Vulture and the Agro-Food Quality District of Metapontino were inaugurated in 2003 and 2004 and have, since 2006, adopted their own development program concerning the characteristics of businesses, agricultural food production and area of expertise with special reference to issues of supply chain development, promotion, training and logistics. In these districts, however, the absence is obvious, of an ability to structure and implement the program guidelines identified, and to allow, for example, through the establishment of centres for community services, the provision of a wide range of services to companies in order to determine an improvement in competitiveness, as well as appropriate policies for local marketing. This

² The distinction between industry and product supply chains or chain in the strict sense is meaningful (Arena *et al.* 1985): the first refers only to the final product, while the second refers to the output of goods, made up of both intermediate goods and final goods. This distinction is important when we proceed to the choice of methodology for analysis of feed and food chain.

was generated by the limitations in the regional law (LR 1/2001). In 2010, the Rural District of Materana Hills and Mountains and the Local Production System of the Pollino - Lagonegrese were recognised, and in a few months they also will be required to submit district development programmes to Basilicata Region. Therefore with regard to the primary sector, Basilicata's territory is organized in local production systems, each according to its own logic of districts for productive activities as regards the agricultural sector; only the north-west of the region remains out of this development model. In 2010, following the call for the submission of Local Development Plans regarding the Leader Axis Regional Rural Development Plans (RDP) from 2007 to 2013, the Region of Basilicata provisionally approved, for the current programming period, eight Local Action Groups (seven of which were already operating in the previous period) whose actions involve almost the entire Region, except for a few towns:

- Metapontino e Basso Sinni (CO.SV.E.L.);
- Medio Basento (Le Macine);
- Bradanica (Bradanica);
- Marmo Melandro (CSR Area Marmo Melandro);
- Alto Basento e Camastra (Basento Camastra)
- Vulture Alto Bradano (Sviluppo Vulture Alto Bradano);
- Alto e Medio Agri, Alto Sauro (Akiris);
- Lagonegrese, Alto Sinni, Pollino e Sarmiento (La Cittadella del Sapere).

Again in 2010, these actors of rural development added new corporate holders with many development programs relying on Axis I and III of the RDP regional partnerships represented by the chain. The regional call for the submission of Integrated Supply Chain Projects³, published in December 2009, was drawn up with the aim of using the Integrated Supply Chain Design, for all regional action supporting the production of fruit and vegetables, cereals, livestock (meat and milk), wine and olive oil, defining for each of these sectors a number of specific objectives. The IPFs constitute coordinated and systematic operations relating to several measures of the RDP and can be activated through a process of negotiation, in which the various participants in a particular food supply chain take part through the submission of a joint application (Integrated Project Sector) submitted by one proponent. The Basilicata region considers that these projects will follow those relating to networks and proximity of protected areas: thus, the entire region will be fully involved in the development of the sector, although the latter are characterized by the presence of different Leader and different programming strategies. In conformity with the new development perspectives in the agricultural field, the role of the local productive systems is very important for local development and investment policies (Frascarelli and Sotte, 2010). The districts and the local productive systems are newcomers to the new programmatic model of the EU's development policy, because they have a flywheel role in its application; as a matter of fact, this policy is based on territorial-related actions. For instance the RDP, which is a strong point in the 2007-2013 planning system, is based on a strategic, integrated and territorial approach, and on the main role of the local partners in promoting development strategies. Thus, the EU's rules about rural development and Common Market Organizations (COM) apply for consultation and partnering strategy, involving the stakeholders in all the planning and implementation

³ In particular, the call aims, through an approach of overall design with aggregation and cooperation between the various participants in the chain, from production to marketing, to encourage the concentration of supply, increase the added value and competitiveness, promote typical products, increase the bargaining power of employers.

phases of those programs. The technical tools are divided into territorial promotion tools (LAG), linking with the territory and the III and IV RDP's Axes, and the economic-productive ones for firm development (the District), involving local firms and the RDP Axes I and II (food chain programs, factory investments, innovation transfer for local firm impact – and common service development, i.e. creation of the Service Centre for the same local factories – territorial impact). The interaction between these technical tools of operative support (LAG agreement pact - District) allows enterprises and territory to share development ideas and projects. In line with the new EU programming, the District, serving as the territorial organization of development, is able to identify strategies for action that can foster the effective integration of territorial RDP EAFRD with the policies promoted by the OP ERDF and the ESF OP: Research and Innovation System and the Information Society can be included under the ERDF or training for businesses in the district to rely on the ESF.

2. Relations between business and integration of supply chain

It is essential to base the analysis of supply chain relationships between enterprises of the same chain in a given local production system. To this end, network analysis is useful to verify and evaluate whether and how companies are able to take advantage of favorable external conditions for their production systems to develop the value chain and create value for the same. The role of relationships and factors such as trust and informal (and formal) relationships may well be crucial in the process of creating value and competitive advantage for the sector as a whole and for the individual companies involved. The network economy offers the advantage of better performance to small and medium size firms. From this point of view, the potential relationship is essential for the development of industry, enabling customers to improve the performance of companies that can benefit from competitive conditions in which actions are integrated in a vertical supply chain system together with horizontal actions of the Integrated Planning. Network analysis has thus enabled a qualitative analysis of the relationship between the companies. It was possible to highlight the characteristics of the relations (content, density, strength, confidence) and the flow of resources exchanged. The methodology used was applied through investigations on companies that took part in focus groups organized by the Basilicata Region in collaboration with INEA - Basilicata to discuss the underlying strategies of the Integrated Projects with operators and to take note of their needs. In the light of this analysis, the relationships between the actors in the chain can be classified into two types: market relationships and those of cooperation. These were in turn divided into formal and informal. The former are often governed by instruments such as contracts where, for example, the withdrawal of one partner entails the necessity of concluding a new contract for the parties concerned in order to continue the cooperation, or based on statutes or multilateral agreements that can only be amended with the approval of a majority of the partners concerned. The transition from one type of collaboration to another is often found to be gradual. Reports on the market relationships indicated a low potential. The number of informal relationships were more numerous, revealing a greater potential. Informal co-operation is the most important index for evaluating the potential relationships in a sector or group of companies. These relationships are solely based on trust and reciprocity. They involved exchange of the following resources (in order of frequency): know-how, information, equipment, labor, encouragement and contacts. The analysis of resource flows has shown that the trade concerned, above all, two stages: production and marketing.

The exchange of information, experience and know-how brings clear benefits for firms by raising production standards. With regard to marketing, however, there was little opening and little interest in sharing know-how. As noted above, the advantage of production at the regional level depends not only on relations between companies in the sector, but also on being in the world of research, education, politics and public administration. These actors have an important role in the economic development of sectors, both for the resources made available, either because they can act as intermediaries between the firms themselves, or because they can give rise to competitiveness for our economy. The competitive ability of a territorial system is, in fact, dependent on policies of territorial marketing, innovation, training and quality of resources, as well as the collective strategies of negotiated planning and strategic planning. Both local companies and institutions play an important role in supporting regional competitiveness through innovation strategies, organizational restructuring and internationalization to improve the external conditions necessary to network and compete at global level. To this end, it becomes essential for the development and strategic planning of programme activities which, based on specific territories, are able to overcome its limitations in the context of the global market. This is the meaning of a system, the creation of value that goes beyond the normal rules of economic theory and economic policy, where actions may play a role (Contò *et al.*, 2011). Agricultural food production, according to its ability to build a system, conveys messages, lifestyles, social patterns and economic implications, represents an important source of competitive advantage for the region and vice versa. These actions represent added cultural and economic implications for the production itself, for the territory and for the entire local production system. The whole is capable of generating an output system that institutionalizes - through internal relationships and relationships between companies and external environment - the product, and creates a positive collective reputation and social utility. These aspects create a new concept of value creation in the supply chain environment; starting from the quality of production and the degree of coordination of local actors, the models theorized allow tools to generate economic growth over territorial and sectoral level. These concepts can help to overcome some weaknesses detected in the food chain of Lucania, affecting in particular, the relationships between actors in the chain, such as:

1. the lack of vertical integration of the sector;
2. the critical relationship between the stage of agricultural production and processing with reference to existing contractual arrangements due to the difficulty of using negotiated formalized agreements;
3. information asymmetries that penalize the agricultural phase, only partially overcome by the expansion of processing centers;
4. the slowness and difficulty in quality management systems through the implementation of traceability/tracing, due to financial difficulties and management difficulties in convincing the membership.

It is obvious that the integration of the supply chain must act in a tangible way to improve these weaknesses by creating, through the instrument of integrated projects for the sector, new relationships: in short, an organization different from those in the sector, leading to an approach to the market in a different and more proactive way. Its synergistic application of the measures of the RDP 2007 - 2013 included in the IPFs contribute substantially to the improvement of relationships between the parties adhering. Following this route, it is essential to refer to the establishment of partnerships as envisaged by the IPF sector through the Temporary Association of Purpose and activation of the contracts for the supply chain. In this way, the vertical integration

of supply chain is through contract between the actors of the production phase with those of the stage of processing and marketing: the first reduces the risk of the market due to price variability, the latter gains safety of supply of raw material in terms of its quantity, quality and consistency of delivery deadlines. Such coordination can make an effective improvement in the quality of production through greater connection between the demands of industry and the upstream productive sector. But the bond is also critical for the quality of production delivered in partnership in line with the provisions in the contracts of the obligation to transfer and discipline production, processing and marketing. For those involved in the different phases, this system of relationships can be a guarantee of income for primary producers, improved technologies and processes for the sustainability of the sector, embodying certain levels of the market but also an increase in the know-how and awareness of human capital (Contò and Lopez, 2008).

3. Multi-functionality as a crucial driver

We propose a possible schematic representation of competitiveness in agriculture, therefore, based on four groups of factors: 1) structural features and business, representing the physical, economic, specific characteristics of farms and farmers; 2) the economic and institutional environment, driven by the policy and sector regulations 3) the conditions of production factors (labor and funds), widening the geographical location of infrastructure and equipment; 4) the relationships with the market for the supply of inputs upstream and downstream, related to the sale of farm produce. If the territory has to become a factor of competitiveness, it needs to take into account a number of factors difficult to quantify and recognize that in many cases there is not even a market value (eg. landscape). This complex analysis, however, ignores the role of highly specific local material resources, intellectual, environmental, social and institutional, that are the result of social and collective actions with strong local roots. A new paradigm of agricultural policy therefore emerges, marking the transition from a productivist vision, which was pinned on the mechanisms of stabilization of markets and production incentives, with an orientation in which the support is to encourage functional behavior of producers to meet the expectations that society feeds to the primary sector. Thus the multifunctionality of agriculture, promoted the conservation of the landscape, brought vitality and a balanced development of rural areas. We can define multifunctionality as the production of public and private goods to help to diversify farm incomes in the sign of socially and ecologically sustainable development (farm, agriculture, education and therapeutic production of local products, tradition and quality linked to the territory). According to this interpretation, multifunctionality is gradually becoming a real business strategy through which to diversify the profile of production and expand opportunities for income. The current concept of competitiveness in agriculture should therefore be more analytical than that traditionally used and take into account all the factors of competitiveness, including those linked to multifunctionality. Agriculture, which, as well as producing safe and quality food, is engaged in environmental protection, conservation of resources and rural landscapes and in socio-economic development of rural areas through employment generation, is defined as multifunctional agriculture (European Commission, 2001) and enterprises, in implementing their activities meet these goals, then, can be regarded as multifunctional agriculture. Agricultural multifunctionality in the enterprise can become the hub of the three goals of economic, environmental and social development. The IPF must become, in fact, the means by which to act according to a logical system to create more added value than the sum of the benefits produced by the implementation

of individual measures and, for the party that promotes the public project, should contribute to sustainable development of land and employment. These objectives underpin the policy choices that land, synthetically, can refer to both pillars of the CAP, apply to all types of business with the difference that the economic enterprises or what might become such must combine these objectives with those of efficiency that every company must pursue in order to compete. The common framework for both types of enterprise thus becomes multifunctional agriculture involving factors such as sustainable agriculture, territorial balance, local socio-economic development, food security (food safety) landscape conservation, the environment and others. Agriculture, compared to other productive activities, is characterized by the strong presence of joint production of output having the connotation of food and non-food goods, and the utility or disutility, both positive and negative, is charged on the whole community. It is clear that the purpose of improving the competitiveness of the farm, the first type of goods and services, those targeted at the market, is the factor of interest for firms defined as economic. But the services will be the crucial driver. In fact, it is by virtue of its relationship of interdependence with the land and the environment that multifunctional agriculture can contribute to socio-economic and sustainable development of rural areas by promoting employment and multiple jobs, stopping the process of depopulation and environmental degradation, using the opportunities of modernization of products with typical quality traits. Multi-functionality has to be seen, therefore, as an economic opportunity for farms.

4. Conclusions

Forms of vertical coordination are an important strategic lever to cope with changes in a scenario of increasing competition. The 'must' to develop long term relationships assumes, ultimately, particular emphasis in the agro-food sector. This is even more true in a totally rural environment such as that of Basilicata, a region strongly linked with the territory and with local actors in the agro-food sector and where the preferences and eating habits are moving increasingly from simple needs to a request for food increasingly differentiated by quality, safety, information, and more value-added content. With this research it has been possible to determine the development prospects of the food chain in Basilicata. The difference between the chain as modelled by agricultural economic theory and that of the integrated project for the food chain identified virtually by the RDP 2007-2013 in the Basilicata region, whose investments are in an imminent start-up phase, is apparent. In view of this, the results of this survey are even more significant for guiding the choices of economic agents in the process and for considering the traditional heritage in the relationship activated with the socio - economic system in which it is located and the mechanisms that regulate the food chain itself to permit them to add greater value at the production phase. Integrated Projects for the Food Chain, supported by strong agreements and internal rules dictated by various types of contracts between operators active at different stages of the food chain itself, confer, in fact, a value that is often not determined by the ability of real operators do business, but by relationships that significantly affect the process of value creation. Managing and directing these positive relationships, knowing the needs of the food chain, may be, therefore, a crucial source of competitive advantage for traders and for the territories. Functions of synchronization performed by firms operating in later stages of the food chains of a particular product and their relationships within it lead to a growing correspondence between the final product offered, the maximization of utility functions of different entities that

compose chain and consumer preferences, and permits adaptation to the changing environmental context. The pursuit of these objectives will, of course, influence the efficiency of the whole system and, thus, its competitiveness.

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GLOSSARY

IPFs = Integrated Projects of Food Chain
LAGs = Local Action Groups
RDP = Rural Development Plan
COM = Common Market Organization
EAFRD = European Agricultural Fund for Rural Development
ERDF = European Regional Development Fund
ESF = European Social Fund
OP = Operational Programme
INEA = Istituto Nazionale di Economia Agraria

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