The natural resources management as a tool for the biodiversity management

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1. INTRODUCTION

The European rural regions, estimated by the OECD density population criteria, represent the 92% of EU25 landscape, producing the 45% of the Gross Value Added and providing of the 53% of the employment (EC COM(2005) 304).

The EU25 agricultural and forestry sectors account for the 8,3% of the employment and the 4.4% of the GDP, covering the 77% of the land use. This land use is for the 12-13% designed as Natura 2000 and for the 10-30% designed as High Nature Value Farming System, where the abandonment risk is higher (IRENA project).

The rural sector has undergone a critical period in the last decades bringing to a re-definition of the rural system role in the EU context. This process has been characterized by the re-thinking of the general functions of this sector through a new analytical and assessing set, in a renewed political and strategic context.

The underlining strategy adopted for rural areas is the sustainable development, that is the engine of the EU development policies on the basis of the decision of the European Council stated at Göteborg:

..."*strong economic performances must go hand in hand with the sustainable use of natural resources and levels of waste, maintaining biodiversity, preserving ecosystems and avoiding desertification. To meet these challenges, the European Council agrees that the Common Agricultural Policies and its future development should ... contribute to achieving sustainable development by increasing its emphasis on encouraging healthy, high quality products, environmentally sustainable production methods, renewable raw materials and the production of biodiversity*." [1]...

The Göteborg strategy is the complementary act to the Lisbon strategy in order to create a new "European model" of development where the European regions point to a competitive increase, to the growth of the innovation technologies, a limitation of the human induced climate change, the control of the public health damages, the responsible management of natural resources and to the improve of transport and land use.

In the "European model" the employment and development growth capacity has to be triggered by a best knowledge and the Innovation Technologies (IT), which should bring together to a sustainable use of natural resources.

Environmental and natural values gain social significance throughout a communication process which is expressed by the so called "social needs", that

[1] Precidency Conclusions, European Council, Goteborg 2001

represent the metaphors and the emblems of this process underlining the society functional changes, or the common perception of a problem.

The virtuous path that the "European model" does pursue, tries to promote new solutions for the social needs, based on the best knowledge, the engine of it, that are manifested as shared strategic choices.

The application of these strategies throughout multi-annual policies, undergoes to a monitoring and evaluation process that should allow an on-going comparison between policies expectations and innovative knowledge.

This framework should generate an adaptive process, in which the interaction between (scientific) knowledge and policy re-launch the sustainable and general development of the EU system.

Applying this strategic framework, the new European Fund for Rural Development (EAFRD) states, in a clear way, the will of the transversal integration of the environmental dimension in a sectorial policy (the Community Agricultural Policy). Actually this kind of integration is one of the fundamental criteria of sustainability, which perceives the natural and environmental resources as a key factor of the social and economic growth, and not as a bridle to them.

The aim of this paper is to analyse the relationship between Rural Development (RD) policy implementation and scientific knowledge, for a sustainable development of the natural stock management, which includes biodiversity.

2. THE POLICY FRAMEWORK

2.1. The rural development policy

During the last century the west countries agricultural productivity has registered a very high increase, thanks to higher energetic and technologic inputs which have brought all the well known consequences (e.g. Boatman, 1994).

Actually this transformation has not generate an income increase comparable with the increase in other sectors (industry, services), although to maintain the rural incomes at a socially acceptable level, it has been necessary to sustain it with direct and mediate subsides.

This system has been (and is today) substantially uneconomic, if considered only in terms of the GDP or employment percentage produced: it costs to the EU taxpayers more than the benefit perceived, and sometimes this could generate environmental and health risk.

This conclusion comes from a traditional economic approach, that do not take into account a series of "externalities".

The inadequacy of the classic economic analysis tools and/or the lack of an holistic vision of the decision makers, could bring to an underestimation of the multiple social and environmental functions of the rural systems. In fact the rural systems produce, as they have traditionally done, several environmental and ecological services.

From this perspective the rural landscape assumes a growing role in the sustainable management of the natural capital and in its reproduction.

The change of the traditional economic vision of the rural landscape is not only related to the production, but also to the social dimension of the development.

The services of countryside are qualitatively and quantitatively lower than urbanised ones; farmers suffer of professional health risk linked to the manipulation of toxic substances and they have a very poor influence capacity on a system characterised by technological inputs and decisions which are far from them. All these elements have brought to a progressive deterioration of the social matrix of many European rural areas.

For these reasons, the new Community Agricultural Policy programming period (2007-2013) shall definitively separate the market oriented polices (where the decoupled direct payment principle has widely been introduced) from the Rural Development (RD) policies.

In this way the EU intends on one side to boost the competitivity of agricultural sector, reducing the trade-distorting issues notified by World Trade Organisation, and on the other re-launch the role of the environmental and social dimension in rural areas.

The RD policies are embedded in the Lisbon and Göteborg agenda through six strategic priorities (EC COM(2005)304), shared at the EU25 regional scale.

1. Improving the competitiveness of the agricultural and forestry sector (key actions: IT, training, integration of agrifood chains, non food products renewable energies, environmental performances);
2. Improving the environment and the countryside (key actions: promoting environmental services, preserving farmed landscape, combating climate change, organic farming);
3. Improving the quality of life in rural areas and encouraging diversification;
4. Building local capacity for employment and diversification;
5. Translating priorities into programmes;
6. Complementarity between community instruments.

It is useful to underline that the split of this strategic priorities split recalls the axis structure of the new proposed EAFRD, where the axis II (Improving the environment and the countryside) assumes the higher weigh in financial terms.

The aims declared by the fund are:

- The improving of the competitivty through a sustainable resource management and products quality;
- The implementation in the RD of the 6° Environment Action Plan (mostly by means of cross compliance);
- The transversal integration of the environmental component (biodiversity, soil-water protection, GHG control, preservation of European landscape);
- The improving of forestry multifuncitionality (acting the Kyoto Protocol, afforestation and biodiversity preservation, soil and water protection);
- The improving of the participative process in the application and implementation of the policy (LEADER approach, Less Favoured Areas redefinition on ecological and environmental basis).

Therefore the RD policy is grounded into a new shared awareness that comes from the cumulating knowledge of a renewed analyses of the socio-economic and environmental problems of this sector. This awareness is a part of the sustainable development framework, that is the engine of the EU25 policies from the Göteborg decision.

One of the central aspects of this new policy is the explicit consideration of the environmental services (economic "externalities"), offered by the rural activities in the natural resource management. These environmental services go from the prime resources management (like water, soil, biodiversity) to the control of common risks (quality and health of the products, hydrogeological risk control), to the socio cultural shared needs, like the animal welfare and the landscape maintenance.

This consideration can generate from one side the enlargement of the traditional agriforestry product markets, on the other side the implementation of the assessment of the "externalities" based markets.

A separate consideration has to be made about the role of the RD policies in matter of climate change choices. In this case these services are striclty connected even with the carbon credit market or with privilegiate renewable energy market.

2.2. The rural development policy as a natural resources management tool

The rural development policy tools to improve the environment and the landscape (countryside) are mostly embedded in the art. 34 of the proposed EAFRD, referred to (i) measures targeting the sustainable use of agricultural land through (payments to farmers in Less Favoured Areas, Natura 2000 and Directive 2000/60/EC; agri-environment payments - animal welfare payments; support for non-productive investments); (ii) measures targeting the sustainable use of forestry land through (first afforestation of agricultural - not agr. land, first agriforestry systems planting; Natura 2000 payments, forest-environment payments, forestry potential and prevention actions, non-productive investments).

Measures are applied inside the new cross compliance and unique payment system, that are essential elements in the strategy of environmental integration in the CAP.

The cross compliance is a granting system of specific environmentalcommitments to the direct payments. The application of sanctions consists of the withdrawal of direct payments in case of non-respect. This is a semi market-based tool, different from the usual regulatory instruments, and its objective is to improve the respect of legal standards.

A farmer receiving a direct payments (single farm payment) shall in this way respect the Statutory Management Requirements (SMR) and the Good Agricultural And Environmental Condition (GAEC).

The SMR are linked to the respect of the environmental directives (water, waste, fertiliser) and some wellness directive (human and animal). In the case of biodiversity (Dir. 79/409/CEE, Dir. 92/43/CEE), no specific control indices are actually proposed.

The GAEC are linked to some general good practices for the soil erosion and the organic matter management (hydraulic control, minimum soil cover, pasture control), the oliveyard preservation and some characteristic landscape elements preservation.

In the last case actually the terracement are the focused elements, and their management is clearly overlapped with the hydraulic control and risk assessment.

Probably the statutory platform is low at the moment, but the risk of a too strict commitments has been a not verifiable situation at the EU25 level and has needed a common standard compromise. In the next years it will be possible to test the efficiency of the system and its it's co-functionality with the agri-environmental measures. An yearly monitoring of the system shall give the possibility to adjust it.

Agri-environment and forestry-environment measures are not compulsory contracts to farmers and forestalls, paid for an environmental service going above the mandatory platform (SMR, GAEC, and regional Code of Good Farming Practices). These measures cover site specific policy and are connected with two broad objectives: the reduction of environmental risk and the preservation of landscapes and ecosystems.

Environmental measures are broadly related to the productive and non-productive land management (EC, 2005)

In the first case they are related to: input reduction and crop rotation measures (water quality; biodiversity and soil); organic farming (same expected impacts); undersowing and cover crops, strips (e.g. farmed buffer strips) to prevent erosion and fire (same expected impacts); extensification of livestock (same expected impacts plus landscape); conversion of arable to grassland and rotation (same expected impacts); actions in areas of special biodiversity/nature interest (impacts on biodiversity); genetic diversity (impacts on biodiversity and landscape); maintenance of existing extensive systems (impacts on biodiversity, landscape, soil); farmed landscape (impacts on biodiversity and landscape); water use reduction.

In the second case they are related to set aside (impacts on biodiversity, water and soil); upkeep of abandoned farm land and woodland (impacts on and landscape, biodiversity and soil); maintenance of the countryside and landscape features (impacts on landscape and biodiversity); public access (impact on public amenity).

In the case of agri-environmental measures, some previous experiences in the administrative and effectiveness field have been consolidated, but in the case of the forestry-environmental measures, the experience is new and probably there will be some difficulties, mostly in the definition of the mandatory platform.

From the policy side, the integration of the environmental component (which is a focal point of the Göteborg strategy) in the rural development, is broadly expressed in this way.

Instead the Kyoto protocol commitments could be reached through: (a) the optimisation of fertilisations (reducing N_2O and NH_4 emission, linked to Dir. 91/676/CEE 31.12.1991), (b) the composting implementation and the diffusion of best practices on anaerobic digestion (biogas) to reduce biodegradable wastes; (c) the optimisation of soil organic matter management; (d) the creation of energetic credit to support biomass production.

The water quality control (nitrate and pesticides) is mostly implemented by means of the cross compliance (that for example means that Nitrate Directive respect is now compulsory for the single farmer). The soil protection is mostly implemented by the SMR, the GAEC, and regional Code of Good Farming Practices and the application of environmental measures.

In the case of water protection, only one measure of the Regulation is actually directly linked to the Water Framework Directive, and the other possible policy drivers are mostly located on the environmental measures.

The main actions regarding the biodiversity are related to reinforced measures to maintain habitat and landscape structures linked to biodiversity (particularly in Less Favoured Areas), to the reinforced ecological definitions of LFA (related to the landscape, agronomic and climatic conditions and not only socio-economic conditions) and finally the direct payments to the Natura 2000 site farmers.

3. NATURAL RESOURCES MANAGEMENT AND BEST KNOWLEDGE: SOME CONSIDERATIONS

3.1. Ecological landscape resource management: state of the art

One of the main developments in the ecological thinking of the last decades in matter of ecology, has been the transition (Hobbs, 1998) from the equilibrium paradigm to the non-equilibrium dynamics, that describes ecosystems and landscape as complex and non linear systems.

Most of the ecological concepts that inform the current environmental management assumptions, are actually based on the equilibrium theories: the successions toward a climax state, the carrying capacity, the island biogeography assumption, to quote some of them.

From the equilibrium theories assumptions descends a management approach that considers that an ecosystem shall evolve toward a stable condition (climax) if freed from external disturbs (that are not intrinsic properties of the system) (Ingerson, 1999). The control or the elimination of these disturbs promotes the evolution of the system toward predictable conditions.

Even if the development of the ecological awareness about the disturbs role, the uncertainty question, the role of historical contingency, the role of scaling and the role of the human presence in the (bio)diversity questions, has deeply modified the scientific thinking about the equilibrium paradigm (Levin, 1999), an effective passage of this thinking into the managers and policy makers thinking has to be carried out (Hilderbrand et al., 2005; Wallington et al., 2005).

This implies from one side the need to fasten the scientific knowledge transfer to the managers and policy makers, and on the other the need to engage urgently the scientific world with social needs. The application of the landscape ecology sciences to the natural resources management should include today social values and different kinds of local knowledge (Robertson et al., 2001).

Inside the development of landscape ecological sciences can be focused some elements useful for the natural resources management.

Ecosystems and landscapes are heterogeneous, dynamic and complex systems; their evolution, not deterministically predictable, is contingent on their history (of disturbs, transformations, management) and on their spatial pattern (position, extent of interaction, degree of human modification).

For these reasons too the landscapes resource management has to be based on an all in approach (Steiner et al., 2000) to be ecologically and socially sustainable. A conservation strategy should plan a management integration of different landscape uses, from the land use and normative sides (Pino et al., 2000).

The consideration that landscapes are heterogeneous systems and that the organisms (protected and not) use resources in an heterogeneous way in space and time has brought to new and different approaches in relation to biodiversity conservation (Simberloff, 1998; Sanderson, 2002), that are not limited to the management of protected areas, but are mostly focused to management of rural and suburban areas (Ricketts & Imohff, 2003).

Protected areas are fundamental in the conservation efforts, but are not the sufficient answer to the worldwide biodiversity conservation problem.

History (land use and disturbances) legacies, dominated by the human one in our landscape, are important in determining the structural and functional characteristics of an ecosystems or a landscape, and their distribution does not depend solely on climate, soil and geomorphology. This consideration has an important role in biodiversity, restoration and natural resource management (e.g. Brotons et al., 2004).

Landscape dynamics can overwhelm the ecosystem dynamics and for this reason ecological networks (*sensu* Franco, 2004) are more and more considered as landscape management tools.

Even if these concepts are not fully considered from the natural resources management approach, they are somehow socially considered, being a programmatic element of the actual RD policies.

The fact that EU biodiversity conservation has to be embedded in the RD policies (AAVV, 2002; AAVV, 2002a; AAVV, 2004; Baldock et al., 2002; ten Brink et al., 2002; EC COM(2001) 162) is an integral part of the new rural development strategies.

3.2. (Bio)diversity: a particular shared social value

The management of primary natural resources (water, soil, air) and their human related consequences (desertification, environmental risk, climate change) has generally a direct impact on the social value perception.

But biodiversity represent a particular case for its complexity and fuzziness. Diversity is a property that attain to the elements of a set, like the genes of a specimen or the species of a community, or to higher ecological classification elements (ecosystems, landscapes), with a clear hierarchy across them and with a growing cultural component through the landscape level.

The emblematic value of diversity comes primarily from the pleasure of seeing a complex variety of forms and behaviours, or in the perception of the complexity as a beauty attribute.

Other aspects are more deeply connected to the individual knowledge/culture and less mediate by physic perception. These could be not directly be perceived by the senses, but could equally involve the observer in a strong way with strong ethic involvement too.

For example genetic diversity, of which biodiversity is the visible expression, is a common legacy necessary to grant the evolution and the survive of our species too in

this planet. But to fully estimate the genetic diversity, we need instruments and an explicative and ruled communicating system (the scientific methods).

Even if this kind of knowledge it is not directly and physically perceived by our senses, it generates an aesthetic involvement in the comprehension of the theoretic object analysed (the problem of genetic diversity risk) and induces to ethic positions, so implying moral valuation (based on a very expert valuation) about the quality of life of the present and future generations.

In this way the diversity ranging from the visive to the scientific involvement, gains the value of social need. This value is today explicit because, by means of a progressive social awareness surely feeded by scientific knowledge but primarily rooted in an common mythic and symbolic substratum, is governed by the shared tools for social values: policies and rules.

In consideration of this, biodiversity management is a problem affordable by society through the management of the natural resources. Science has tried to develop several tools to estimate objectively the biodiversity, in order to give the best information to policy makers and managers (*e.g.* Bava et al., 2002; Burel et al. 1998; Davic, 2003; Fournier & Loreau, 2001; Hess & King, 2002; Rubino & Hess, 2003; Rey Benayas & de la Montaña, 2003; Sweeney & Cook, 2001; Wagner & Edwards, 2001).

But despite all these objectivity efforts few fulfilled results have been reached (He et al., 2002; MA, 2005) and it is evident that the analyses are always concentrated on few *taxa* (Allen et al., 2001; Franco, 2003; MA, 2005) particularly in the case of nature conservation purposes (with the connected load of emotional and evocative consequences). The same few *taxa* that we found described in the holy texts or in the figurative arts of most of the human societies.

These elements, and the complex cultural (symbolic-mythic) weight of the social value of biodiversity, should be accounted for by the scientific world.

That is diversifying the approach to the measure of biodiversity by identifying the best set of tools available at the best scale (local, regional, global) and by relating it to the best correspondent definition of biodiversity, that could be confused in the *per se* term (*e.g.* biodiversity as element of ecosystem resilience) or in a single attribute of it (*e.g.* the loose of a valuable food resource). In this way the scientific community could give the best information to the society.

But from the other side the scientific community should engage more directly in society splitting in the best way the measurable and not measurable attribute of biodiversity from the management point of view, to actually receive the feedback from the society in order to correct its information flux.

4. THE RELATIONSHIPS AMONG STRATEGIES, KNOWLEDGE AND RESULTS

Considering the items briefly treated above, some questions arise to our attention.

Does the policy instruments (EU strategies and regulations, National-Regional strategies, programs and schemes) really cope with the policy goals?

Are these tools effectively feeded by the best scientific knowledge and environmental management application?

The problem is wide and complex, but some possible answers could be given, using as reference example a broad analyses on the effectiveness impacts of agri-envronmental measures in the last programming period (EC, 2005).

From the policy - managing point of view, the agri-environment measures are flexible and locally adaptive, and could meet the environmental needs: they could be efficiently mixed to be amenable to local conditions.

Their contractual nature has an high rate of acceptability among farmers: they are useful as educational tools for environmental awareness of farmers and can represent a marketing benefit for the general public.

Agri-environment payments combined to Less Favoured Area payments, can represent a good instrument to counteract to the environmental risk of land abandonment and marginalisation.

So this programming tool appears to be effective to comply with the sustainability strategies, coupled with the SMR, GAEC, and regional Code of Good Farming Practices from one side, and with the landscape preservation (non productive investment and GAEC) and structural transformation (afforestation, agri-forestation) on the other side.

But from the scientific-information point of view, there is no monitoring of the environmental effects of the applied measures, and when data set exists they do not provide a sufficient basis for a comprehensive estimate of these effects.

Impacts are generally argued by projects and studies related to similar issues and extrapolated to estimate an overall impact from the rate of measures contracted.

The impact evaluation is in this way extrapolated by uptake figures: up to date there are enough available information to be used for illustrative purposes, but it is not always possible to aggregate different uptake figures or to allocate clear area data to individual measures.

Instead few results come from the ground, measuring the environmental impacts. This could be partly related to the short programming period available.

Even if some EU regions have made efforts to develop real environmental evaluation, the evaluators have doubts whether the monitoring is advancing as it should be.

These results can actually be used with the SMR measures, which need longer monitoring time to be evaluated, and to the landscape preservation (non productive) and structural transformation (afforestation, agri-forestation) measures.

In this case rarely a new created landscape patch, has been analysed on a landscape scale, and very rarely has been previously optimised on a spatial scale analyses. The *ex post* studies done in this field confirm the necessity of this kind of approach to reach effective results (Madsen, 2002).

5. CONCLUSIONS

From the brief analyses of some reference figures in the policy and natural resources issues, it’s possible to draw some conclusions.

In general EU rural development policy appears to be a good strategic approach in achieving the strategic design of a sustainable "European model " of development.

Policy programming tools seem actually to cope with competitiveness, employment and natural resources sustainable management, giving to the "externalities" of the "environment" a new marketable perspective and transforming the environment in a competitive boost.

Actually the strategic approach and the economic policy instruments (schemes of measures) seem to be progressively able to ensure the strategies aims, mostly coupled with a (annually) review system that should optimise the local fit of the policy.

From the socio-economic, administrative and financial point of view, this seems to be realistic, but what lacks is the information feedback of the best scientific knowledge to the policy input, a central principle of the "European model" of sustainability.

This could be linked to the difficulties of science to inform policy and management (Baskerville, 1997), to the difficulties of the social and human science to interact each other to jointly inform the policy and management decision, and to the delay in the upgrade of policy and management output (Wallington et al., 2005).

These information feedback (human) difficulties, are coupled to:

- the complexity of the treated system (rural landscape), that intrinsically brings uncertainty that has to be communicated possibly in terms of trajectories and scenarios to the managers, to allow them to progressively adjust the solutions adopted;
- the fact that disturbance (human and not), openness and heterogeneity are intrinsic features of rural landscape, and that composition, structure and functions of a single rural ecosystem are contingent on its history and spatial context (Turner et al., 2001).

The complexity and uncertainty of this system is coupled with the complexity of the policy measures used to implement the rural sustainable development. To account to these characteristics a long-term and structured survey approach, is needed to define probable output and to fulfil the lack of feedback between knowledge and effects.

Monitoring the environmental effect of policies and management solutions is essential to cope with the high variability of rural ecological systems, and on ground data are necessary to verify expectation and to cope with uncertainty.

The actual lack of science-policy-management feedback and its consequence is exemplified by the assessment of environmental measures effects on the environmental policy objectives (EC, 2005).

Administrative and financial monitoring of measure expenditure (uptake figures) does not give direct information about the environmental results of their implementation, and does not give efficient information to review the programs and schemes to cope with the policy objectives.

On the landscape preservation (non productive) and structural transformation (afforestation, agri-forestation) side, similar consideration may be drawn.

Research does suggest that natural resources' policy strategies and programs decoupled with landscape spatial planning, are not necessarily correspondent to the policy objectives (Franco, 2002; Jongman, 2002; Madsen, 2002).

But problems bring solutions, and considering that uncertainty is a core concept of the nowadays non-equilibrium ecology, and most ecological knowledge comes from

managed systems far from a human free equilibrium climax, the first solution is to enforce the information feedback between theory and application, to adjust management solution (Wallington et al., 2005).

This will mean a direct engagement of the scientific world with society, to promote upgraded consciousness in the policy makers, to correctly drive the bureaucratic engine. Yet examples exist to feed this exchange.

Ecological trajectories (Hughes, 2005) can be defined as a probabilistic change at an high time scale level that accounts for history legacy of landscape and embedded interannual variability: they are less predictable and more representative in terms of real world uncertainty. Trajectories can change direction, changing the information of external parameters (e.g. climate change), giving to the policy makers and planners and evolving information to adjust and review their intervention tools.

Scenarios (Nassauer & Corry, 2004) are another interesting example how a non equilibrium system approach coupled with (i) a multi disciplinar approach to avoid the low communicability between human and social sciences vision, (ii) a structured participatory process that can be used to feed policy design in rural landscape. Scenarios are plausible outcome on landscape of different human policy driven priorities for rural landscape.

Other case studies exist that link landscape land use modification, induced by rural development policies to spatial planning to optimise the natural resource management (Franco, 2002).

Each of these approaches accounts for the intrinsic characteristic of the treated systems (as outlined above) and of the embedding of social values, by means of participatory processes or considering the valuation of shared societal values.

The following key points could come out from the analyses carried out in this paper.

- A clearer definition of environmental objectives pursued by single and mix of measures in each program is essential, feeded by the best knowledge available.
- A better and locally based scientific approach to value the services offered is needed, designed to be adaptive during the programming period.
- The long term monitoring and the scientific on the ground evaluation of measures impacts is urgently needed, and it should be embedded in the programming structure. Uptake indicators alone are iunsufficient to generate an effectively environmental assessment of the RD policy, and a first step could consist in the implementation of scientific sound environmental indicators to be used in the evaluation process (Castellini & Regazzoni, 2004).
- Providing environment services can represent a new market for rural enterprise income and is a central issue in the RD strategy to effectively reach sustainability. The "externalities" markets should be encouraged (i) by clearly estimating the services as shared public benefits (climate change, biodiversity, hydrogeologic risk, landscape amenities), (ii) linking these benefits to emerging markets to maximise the sustainability synergies (to privilege bioenergies for their sinergyc implication on climate change carbon market and on renewable energy policies).
- A better evaluation at the landscape scale of the environmental services linked to the policy objectives would be possible by geo-referencing the measures

application: in this case the synergies with risk assessment and natural resources management and planning should be attainable.

- There is a strong need to link measures application to affordable spatial planning DSS at the local scale to optimise landscape functionally, using correctly the ecological network concepts in a more effective natural resource management perspective (Franco, 2004).
- In general for their best result a partecipative approach with the local actors, scientific bodies and stakeholders is important before and during the programme implementation

Two concluding remarks could end this paper.

The strong connection between history contingency and ecological evolution of rural systems is nowadays a scientific central point. Rural landscape history legacy is perceived too as a shared public good, considered in such way by the EU policies. The implications of this analogy are perhaps far deep than could seem at a first glance and could represent a thinking bridge between ecological and social science and policy.

The second remarks is related to the application of the scenario approach to inform the rural development policies in Iowa, USA (Santelmann et al., 2004). The results of this effort did generate a output that in the strategies and in the policies applicative principles are surprising overlapped to the RD European policies.

In this case *it does result particularly interesting that another big country* with a different history and availability of resources but a similar 1) socio-economic back ground approach (classically economic) for the resource utilization, and 2) capacity in the resources exploitation, *has reached similar results* regarding the cure to the weakness and damages of such an approach.

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