

Towards an integrated management of the lower Danube fisheries

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Abstract The purpose of this paper is to point out who could be the socio-economic actors interested in lobbying for an integrated development of Danube's fluvial fisheries, and who could be the actors interested in lobbying against such a development. It results that, from the main users, very interested in the integrated development of the Lower Danube Fisheries (i.e. LDRS) are the fishers, somehow interested - the foresters, and not interested - the farmers. A 'tactic' for surpassing the seemingly dominating farmers' lobby is suggested.

Key words: fluvial system, Danube, integrated management, users, lobbying

Introduction

Development is that part of the management aiming to initiate a new flow, or improving an existing flow, of benefits from the productive system. Development measures are not controlling or planning measures (management measures *per se*), but target the qualitative or quantitative change of the components of the envisaged productive system (physical capital, human capital, cultural capital, and natural capital). Land use changes made in order to change the flow of natural resources and services (such as the substitution, conversion or reconstruction of ecological systems) are development measures.

The traditional and still dominant approach in fisheries management (and development, as part of the management) is to focus within the fishery itself for increasing benefits from the fishery. But there is also a direction change towards integrated fisheries management. In the integrated fisheries management the attention is paid to all relevant resources and services simultaneously, and, beside the rent generation, there is a focus also on people and local socio-economic systems including in their ecological footprint the fishery.

The integrated management of coastal fisheries is becoming common (under the influence of Agenda 21 – Ch. 17 stipulations), due to a trend in recent years among agencies supporting development effort to broaden aid to a 'multi-sectoral' model [2, 9]. However, the integrated management of fluvial fisheries is still uncommon, despite the increasing knowledge concerning the resources and services provided by fluvial systems.

It is worthy noting that in the case of riparian forest, included in structure of the fluvial systems, there is a stronger trend towards integrated management [13]. Also, in the case of the riparian forests belonging to very large fluvial systems, such as LDRS, the integrated management of forests cannot deal only with the riparian forests, but have to deal with the whole system, if it is to preserve the full range of resources and services provided by the forests [16]. We underlined this aspect in order to point out that the integrated management of riparian forests of very large fluvial systems envisages the same system as the integrated management of the fisheries of large fluvial systems. If it is like this, one could prefer to speak about neither about the integrated management of fisheries, nor about the integrated management of riparian forest, but about the integrated management of the fluvial system. However, as we are here addressing mainly fishery scientists, we prefer to keep speaking about the integrated management of the fishery.

In this context, the purpose of this paper is to point out who could be the socio-economic actors interested in lobbying for an integrated development of Danube's fluvial fisheries, and who could be the actors interested in lobbying against such a development.

Materials and methods

The material consisted in the literature published with regard to the Lower Danube fisheries management. The method was the critical analyses, including conceptual analyses where distinctions or similarities between terms were needed.

Results and discussions

We first show the identity, from ecological point of view, of the Lower Danube River System (LDRS) and the Lower Danube Fisheries (LDF). Next we present what is supposed to be the integrated management of LDF, according to existing scientific and managerial knowledge. Further we refer to conflicts of interests related to the integrated development of LDF in function of different portfolios of societal development goals. The last section deals with the tactic for promoting the integrated development in LDF.

Lower Danube fisheries vs. Lower Danube river system

Further arguments towards the above aspects are given by the analyses of the definitions of LDRS and of the Danube fisheries.

Vadineanu and his colleagues [30] describe LDRS as including the following major hydrogeomorphical units:

- the Danube (Danube River and Iron Gates lakes), the floodplain (upstream floodplain, inner Danube Delta, downstream floodplain), the Delta (core Danube Delta, Secondary Chilia Delta, Dranov floodplain complex), Razim-Sinoie lagoon complex, and the Coastal Black Sea.

The Romanian Fisheries Law 192/2001 includes in the natural fisheries (as mentioned in Art. 3), besides other ecological systems, the following:

- the Danube, the Delta, the floodplain, the Razelm-Sinoie complex, the Coastal Black Sea.

Thus, the terms LDRS and LDF are two names of the same ecological system. However, while the name LDRS is neutral with regard to the kind of resource and service produced by the system, LDF is biased towards the use of the fish resources produced by the system.

One might argue that in the diked areas of the LDRS there is no fish, so no fishery. The reply would be that LDRS is a spatial-temporal systems, and the lack of fish in diked areas characterizes the current state, but did not characterized the reference state (for instance that described in [3], or might not characterize the future state, such as after reconstruction. Consequently in this paper we use interchangeably the two terms (LDRS and LDF).

Integrated management of lower Danube fisheries

One can say that Antipa [3] promoted *avant la lettre* an integrated management of LDF, even if he was limited by the knowledge concerning the resources and services provided by LDF at that time. The basic idea of his managerial efforts was to maximize the benefits obtained from the Royal lands located in the Danube floodplain, and in this respect he, lead by common sense, involved the local communities. What is different today in the approach is the much better knowledge base about the natural capital and about the array of resources and services, as well the recognition of the fact that incorporating in the management plan of equity issues concerning the distribution of benefits between local and upper societal levels is a must, simply because groups with altruistic behavior of their individuals are more productive than egoistic groups, as they spend fewer resources in managing the conflicts inherent to the functioning socio-economic systems [18].

In the Danube Delta the Biosphere Reserve status asks explicitly for an integrated management [4], but in the fisheries located upstream the Danube Delta fishery scientist currently seem to focus on a sectoral approach in the management [27, 6]. They look mainly for improving the access rights, the institutional settings or the technical measures, even if there is a recognition of the fact that the low current stocks are due mainly to hydrotechnical work and to decreasing water quality [24].

The Danube River Basin Management, according with Water Framework Directive, is relevant for the design of the integrated management of LDF, but focus only on hydrological and biogeochemical services [15].

Cristofor [10] coordinates a research that contributes to establishing the basis for an integrated management plan of LDF. In the first chapter of this study it is shown [20] that an integrated management plan of LDF is required in view of reaching the strategic, tactical and operational goals as stipulated in the National Strategy for Sustainable Development [26]. The measures of the integrated management plan have to focus both on the natural capital and the socio-economic systems, including the institutions responsible for the designing and implementing the management, and have to be supported by an adequate integrated monitoring system [22]. One of the conclusions of the mentioned study is that at least 120000 ha of diked wetlands in LDF upstream Delta have to be reconstructed [31]. The reason of this reconstruction is the optimization of the resources and services offer of LDF, which now are at a pretty low level, in agreement with the maximal potential of LDF (as indicated by the reference state) and with the costs of the reconstruction (as indicated by the cost-benefit analyses).

Thus, restoration is a demonstrated needed step in the integrated management plan of LDF. It is one of the development measures which have to be included in this plan. Restoration already started in polders of the Danube Delta, and proved to be effective [28]. But there is a bias between the Delta and the upstream

parts of LDF.

The restoration of important floodplain areas is envisaged by the Program of ICPDR (ICPDR, 2001). According to this plan, Romania has to invest 73.9 millions Euro for restoring five local landscapes. The objectives of ICPDR for this restoration are related mainly to water quality improvement. The restoration sites are those established within the Lower Danube Green Corridor program promoted by WWF, and are governmentally supported also by the Declaration signed by Romania, Bulgaria, Ukraine, and Moldova in June 2000. The sites do not include the major islands of the Inner Danube Delta (such as the Big Island of Braila), former very important fisheries [3], dominated now by state agricultural farms, and proposed in part for restoration [19], with research projects already dealing with aspects of the restoration plan [16, 17].

The Lower Danube Green Corridor program promoted by WWF has larger objectives than the restoration envisaged by ICPDR, focusing on species diversity problems, ecosystems diversity problems, and water quality problems, but it is far from an integrated approach of the problems of the local socio-economic systems in relation with the natural capital (NC-SES). Starting from the Green Corridor concept one could develop the idea of a Danube network of NC-SES systems promoting the integrated management. Two components of such a network of integrated management areas are already functioning or in project: the Danube Delta Biosphere Reserve [4], and the Small Island of Braila Natural Park [1]. By using the Green Corridor concept and the results of the study coordinated by Cristofor [10] one could design an effective network, whose emergent objective as a whole have to be the maintenance of the emergent services and resources of LDF [21] at levels of production acceptable for the SESs hierarchy (from local to national level). In order to be able to do this, and to increase the long term benefits of the society, the competition between local institutions involved in the management design of LDF should be avoided.

One might ask why, if the integrated management is demonstrated as beneficial to society, it is scarcely adopted by now in practice in LDF? The proposed answer is: because of the interests to keep the current management practices, and because of the competition between the institutional management designers. The second cause is targeted by the last part of the paper, so we focus here on the first cause. Management options arise in local, regional, national and even international political-institutional conventions, rules and regulations. Stakeholder analyses focuses primarily on the people who have some kind of interest in the area and who will be positively or negatively affected in welfare terms by a change in the ecological system's management regime [8]. Suggested changes in management practices in the ecological system may reduce or reinforce conflicts between the various interests involved. This may lead to resistance to the suggested change. From a policy point of view it is important to know how these interests can be balanced. In order to be able to do that, insight is needed into what the various interests in the area are, who the stakeholder are and what the distribution of the positive and negative effects of changes in management regimes will be. Below we focus on the interests related to the adoption of an integrated management with regard to LDF.

Conflicts arising in view of the integrated management of LDF

In this part of the paper we present the identification of the kinds of stakeholder involved, based on the already published functional analyses of current and restored LDF [21, 31]. The exact identification of the stakeholders in the LDF part located upstream the Delta is a complex objective, tackled only in part by now [7].

There is no universal measure of the intensity of the interest. However, taking into account that in the total economic valuation (done by using cost-benefit analyses) always is included a discount rate [2], we can in turn consider that the benefits of restoration appearing after a long time will rise lower interest than those appearing after shorter time, all the other variable being the same. Another important aspect is that we have to make a difference between interests of stakeholder belonging to existing functional modules of the local SESs, and potential interests of the stakeholders corresponding to uses of the NC which are not occurring in the current SESs, but can occur after restoration. These potential interests are in fact interests for an opportunity to use the NC in the future (after restoration), and cannot be directly related to certain current type of users, although the management design might take into consideration a special type of current users to be reconverted towards the new opportunity of use.

Another delineation that we have to make is between interests at the local level, and interests at the governmental level. We operationally define interests at the local level as those associated to resources and services that can generate directly wealth in the local SES (resources, potential for tourism, some hydrological and biogeochemical services), or in other words, are intercepted by the local SESs [14], and interests at the governmental level those associated to services, which, even if generating wealth for many local socio-economic systems (many hydrological and biogeochemical services), can be managed only at governmental level. In this respect, Brouwer and his colleagues [8] point out that the values (evaluated by

the willingness to pay, thus reflecting the local SES level) associated with wetland functions very important locally (such as flood control or wildlife habitat provision) are higher than those associated with wetland functions from which benefit not only the local SES (such water generation, water quality). On the other hand, it is known the biogeochemical services associated with water quality generates most of the value of a wetland surface unit in LDF [29]; the explanation arise from the fact that in the second case the value of LDF water quality services is computed based on other methods, and reflecting the interest of the government in reducing the discharge of nutrients into the Black Sea.

Not least, we have to mention here we use the term “user of resource and/or service” as meaning not only those actors directly involved in the extraction of the resource, but also those actors which are vertically integrated with them or directly depending on them. For instance, the term “fishers” refer, in the discussion from below, to fishers, their households, those involved in the post harvest sector, those involved in the fishery management, and those involved in the assistance of the management (managers and researchers). The same holds for “farmers”, and so on.

Table 1 shows elements for analyzing the influence of the potential LDF development by restoration on the current users interests for such a development. Table 2 shows the influence of the structure of the portfolio of societal development goals on the groups potentially lobbying for or against LDF development by restoration.

The main remarks to table 1 are:

- most local users have to be interested in the restoration, including fishers; however, their lobby potential is low, comparing with governmental users, but there is an advantage arising from the fact that increasing benefits from CN at local SES level are in agreement with the Agenda 21 principles and the National Strategy for Sustainable Development;
- foresters, with benefits mostly at governmental level, so with high lobby potential, may be interested in restoration, but to a low degree because of the long time until benefits manifestation after restoration;
- farmers (with high lobby potential) may be strongly against restoration, as the benefits related to this kind of use will strongly decrease after restoration. It must be noted the economic inefficiency of many diked areas [28, 29], some of them recently keeping a high profile even in the mass media, which points out, for instance the big economic problems of the administration of the Big Island of Braila. However, as long as most of the diked areas are state property, the economic inefficiency can be masked by governmental measures, so apparent benefits could arise as the result of public subsidies;
- conditions for tourism in restored areas of LDF would be strongly improved after restoration, but there are no current users at local level to lobby for this; some support could be found only at the specific governmental level;
- water quality services will be strongly improved after restoration; however the setting of restoration for nutrients retention is already negotiated [15], even if it is not satisfactory from the point of view of other resources and services.

The main remarks to table 2 are:

- The portfolio of objectives should include at least the objectives 1-4; adding the objectives of equity and employment to the basic objectives would strongly enhance the interest at local socio-economic level;
- The Romanian administration [23] notes that the increase in fish export is limited, beside others, by the fact that there is not, on foreign markets, a high demand for the currently offered dominant species. Restoration of LDF might change the situation in this respect, as well as in the dimension of the stocks, thus contributing to objective 5.
- Fishery post-harvest sector development as a result of increasing stocks might contribute to objective 8;
- Objective 7 might be appropriate for the LDF district socio-economic systems, which are suffering from economic and social problems [7], as well as objective 6 for the local socio-economic systems, taking into consideration their current depopulation trend [11, 7];
- Thus, the objectives 5 to 8 might also be included in the portfolio, in function of the conjunctural governmental priorities.
- There is a potential conflict of interest between farmers and other sector with regard to the integrated development of LDF. Such intersectoral conflicts are recognized at governmental level in terms of conflicts between the strategies for the development of different sectors: extraction, agriculture, forestry, energetic, tourism [23].

There is a governmentally recognized need to change the management system of the fishery sectors [23]. But when the users have the feeling that they cannot control the direction of the management there is no great political pressure to be proactive. One needs, if it is allowed to speak in chemistry terms, a cataliser to activate the advantaged stakeholder, and to promote the “reaction” of transforming an inefficient

management of LDF into an efficient one by lowering the “activation energy” due to the current potential conflicts of interests. A tactic for determining such catalyses is proposed below.

Table 1 Elements for analyzing the influence of the potential development of LDF by restoration on the current users interests for such a development.

Resource / service	Direction of change after restoration	Time of benefits manifestation after change	Current user / manager	Level of final current dominant beneficiary
<i>Resources</i>				
Fish	++	medium	fishers	L
Wood and game species	+	long	foresters	NL (Gov)
Medicinal plants, honey	++	medium	villagers	L
Systematic agricultural crops	--	NA	farmers	NL (Gov)
Traditional agricultural crops	+	medium	villagers	L
<i>Services</i>				
Maintenance of species diversity and ecological systems diversity	++	long	MWEP	NL
Absorption of secondary products	0	NA	industry	L
Water quality improvement	++	short/medium	MWEP	NL
Flood mitigation	++	short	MWEP	L
Regional microclimate improvement and groundwater recharge	++	medium	MWEP	NL
Conditions for tourism	++	long	none*	L
Transportation pathway	0	NA	transporters	L
Remarks	Directly related to the intensity of the user interest for restoration	manifestation after long time decreases the intensity of the interest	If there is no current user, there is no current interest	Final beneficiaries at G level are more influential than those at L level

Legend: “+, ++” = increase in the production of resource/service, NA = not applicable, MWEP = Ministry of Water and Environmental Protection, L = local (within LDF), NL = not-local, Gov = governmental, * excepting for Danube Delta and Small Island of Braila

Table 2 Elements for choosing the portfolio of objectives which maximize the potential interest for the development of LDF by large scale reconstruction.

Societal objective of the LDF management	Potentially For		Potentially Against	
	G	L	G	L
<i>Basic objectives</i>				
1 Sustainable production of high level of natural resources and services	fisher foresters	fishers foresters	farmers	farmers
2 Economic efficiency, economic viability	MWEP			
<i>Optional objectives</i>				
3 Distribution equity	Gov	LA		
4 Employment	Gov	LA		
5 Export promotion and generation of foreign exchange	Gov			
6 Decreasing urban-rural drift	Gov			
7 Maintaining a regional balance of development	Gov			
8 Industry diversification	Gov			

Legend: G = at governmental level, L = at local level, Gov = governmental, LA = local administration, MWEP = Ministry of Water and Environmental Protection.

Tactic for promoting the integrated development of LDF

The opportunity for values of the natural capital (as reflected in the integrated management plans) to be incorporated into societal decision making is an indicator of the health of a democracy [25]. This means that in a healthy democracy the flux of resources and services absorbed from the natural capital is higher than in the absence of such democracy, because of the possibility of developing and implementing integrated management plans, which is not surprising, taking into consideration that healthy democracies belongs to SESs in an advanced succession stage [18]. In medium advanced SESs governments do not

maximize the wealth of the society, because of the low quantity of resources which people are able to invest in the public control of the government (op. cit.). Thus, in such countries governments have to be persuaded by other means to increase the quality of the services that they provide to the society. The aspects relevant to such persuasion are: pointing out the favorable elements for lobbying the integrated management of LDF, establishing the tactical objectives, delineating the tactical plan.

Favorable elements for lobbying are:

1. Most diked areas are economically inefficient;
2. The International Commission for the Protection of Danube River already promotes restoration;
3. Foresters have strong lobbying capacity and might be interested in the integrated management;
4. There is experience in designing the integrated management both in Danube Delta and the Small Island of Braila (INCDDD Tulcea and University of Bucharest);
5. Other research and development institutions might be interested to be involved in designing the integrated management plan of LDF started from existing work, and consequently in the lobby ("Lower Danube University" of Galati, Academy Institute of Biology IBIOL, Academy Institute of Geography, Research and Development Institute for Environmental Protection – ICIM Bucuresti, Romanian Institute for Marine Research)
6. IAD [6] is committed to be involved in the conservation of the floodplain along the Danube and its tributaries;
7. RAMSAR and WWF have strong lobbying capacity, and might be interested in the lobbying for the integrated management of LDF;
8. International financial sources (GEF, UNDP, UNEP, World Bank) tend to promote projects of integrated development.

Tactical objectives could be:

1. The integrated management of the Lower Danube Fisheries to become a stated goal at the Romanian Government level; next
2. The development of integrated management plans of key diked areas as part of a complex integrated management plan of LDF to become priority for the Romanian Government in view of international financing

These objectives can be seen as part of the Action Plan for the implementation of the National Strategy for Sustainable Development [29]

As for the tactical plan for achieving the objectives we propose a systems approach consisting in coupling a bottom-up approach (from local level to Romanian Government) with a top-down approach (from ICPDR to the Romanian Government).

The bottom up approach would include:

- constructing a core task force including the mentioned research and academic institutions;
- attracting forestry research in this task ;
- developing a project for attracting the local administration of LDF SESs in the taskforce; these project could be run in consortium by the institutional partners, or by a widely recognized professional organization (such as, for instance, the Romanian Society of Ecology);
- identifying viable alternative of livelihood for farmers at local level by running specific projects;
- applying in consortium for local funding a major research project for advancing in the design of the integrated management plan;
- keeping a high profile in the media and developing contacts with NGOs capable of adding value to the existing group of partners;
- contacting the main political parties for promoting the adoption of the tactical objectives.

It is known that the short time span of the governments' life limit their appetite to take practical initiatives on the long term, unless there are no clear media benefits for the involved parties and politicians. Thus, the task force should focus not only on scientific aspects, but must have a strong interface to public and a high profile in the media.

Financing of the task force can be done in the first phase by the involved partners to cover human resource input and communication costs. In the second phase special costs can be included in the projects developed by the local consortium. Competition of local institutions for local and international funding which generally limit the formation of local consortiums, should be given up to the maximum possible extent, because the societal role of scientist is not only to do science and obtain direct advantages from this, but also to promote general human values as reflected in the public good. Formation of local consortiums which are further integrated in international consortiums is feasible, as demonstrated by recently financed EU projects [12]. Thus, scientists belonging to different institutions should normally be

motivated to start building the task force, by material medium term interest and by interests related to the societal status.

And the top-down approach would include:

- proposing to IAD the formation of a new IAD work group dealing with the integrated management of the Danube System;
- using this work group for developing a Danube's international consortium for developing a project for 6th FP, as discussed during the 34th IAD Conference (Tulcea, 2002);
- using this work group for promoting the organization of similar task forces in the Danubian countries;
- contacting RAMSAR and WWF and proposing them to support the idea;
- accessing ICPDR, and promoting the idea of a Danube's network of areas with integrated management, mainly by IAD, but also by other organizations with observer status at ICPDR, such as RAMSAR and WWF.

Conclusions

1. The change of the current Green Corridor into a network of SES-NC systems managed in an integrated manner will increase the societal benefits arising from LDF;
2. A needed developmental measure in the regional integrated management plan is the extensive restoration of the floodplain, at a higher level than the current Green Corridor;
3. There are potential conflicts of interests in view of the integrated management of LDF putting, roughly, farmers on the one part and the others on the other part;
4. There have been proposed tactical objectives of the lobbying for an integrated management of LDF;
5. It was proposed a tactic for promoting the objectives by national and international lobbying;

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