



Two case studies in which agricultural land retrocession led to land fragmentation and the arise of litigious situations

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Abstract. Land fragmentation, as a result of retrocession in the Daia Română commune in Alba County, Romania, led to the impossibility of placing a sewage treatment plant according to the most efficient projects existing in the country. Crisis created as a result of abundant rainfall, above the average level, as well as the improper design and execution of the treatment plant, with faulty operating management, great material damage and environmental pollution occurred leading to a real regional ecological disaster. All these shortcomings started from the failure to secure a considerable area of land for the location of a sewage treatment plant, an area that was not within the reach of Daia Română - Alba County due to the land fragmentation and their passing into private ownership for other uses. In the second situation, four natural persons from Bistrita Năsăud County requested, since 2010, through different courts (Judiciary, Law Court, Court of Appeal) the recession of the existing lands under the water luster of three lakes which are part of the fish pond arrangement from Sigmir, near Bistrița municipality. In this case as well, material damage would have occurred, not only through the disappearance of an economic profit center, but also through environmental degradation in the area and its surroundings, taking into account that the main role of these water bodies, lakes, was either protection against floods and control of the phreatic level of the waters coming from springs, streams, rainwater from the slopes, etc., or the water from these lakes was used to irrigate the orchards, especially the young plantations.

Key Words: land fragmentation, sewage treatment plant, water bodies, orchards.

Introduction. The fragmentation of the lands located in the urban and/or rural area of an Administrative Territorial Unit (ATU), in most cases, generated difficulties, compromises in the implementation of projects of common interest or led to the stagnation, destruction of some industrial or agricultural production units. To exemplify, two situations were chosen that, apparently, are different, but both had a negative impact on the environment and/or caused large-scale lawsuits, with significant material damage and, later, material compensations imposed by law. In some cases, through the emergence of specific laws, destructions were possible to be prevented, but these also caused disputes.

Case study no. 1: The sewage treatment plants from the Daia Română commune, Alba County, Romania. The first case is the situation of the Sewage treatment plants (SE 1 and SE 2) located in the Daia Română commune, Alba County, Romania. The Daia Română Administrative Territorial Unit is developing a plan for the modernization of the locality through SC APA CTTA SA Alba for the implementation of a drinking (potable) water network and the sewerage of waste water in the locality (Expertise file no. 611/P/2021).

Waste water, in accordance with the legislation in force, had to be purified, brought to the level of STAS requirements in order to be discharged into the discharge (outlet) channel. Based on a project, two sewerage treatment plants were built:

- The main sewage treatment plant SE2, located in the middle of the Daia Română commune, close to the Daia stream;
- The secondary sewage treatment plant SE1 located downstream - approx. 800 m from the entrance to the Daia Română commune, coming from Sebeș.

Although it started from a good idea, the lack of necessary surfaces (spaces) for the application of a viable project makes the development of an efficient sewage treatment plant not possible, by building the two treatment plants, the unit had great shortcomings. Both, the sequential design, construction, operation, but also the management of the waste water from reception (collection) to discharge into the discharge (outlet) channel was defective. For a locality with a population of 6,000 inhabitants, a functional station must achieve the purity parameters of the water discharged into the discharge (outlet) channel, the management of the resulting sludge and the analyses required and imposed by the national legislation. These analyses are carried out either with the help of automatic alarm sensors or analysis kits, the results being recorded and kept for a period of time, depending on the importance and the effect of the analyzed parameters on the environment.

At a sewage treatment plant the flow starts from the reception of waste water and ends with the sludge deposit and the removal of treated water (Panaitescu 2011), by carrying out the following technological operations:

- removal of coarse impurities (clarification), waste water basin, grates for retaining coarse waste. The grates are provided with scraping and emptying elevators. With the help of elevating scrapers, coarse waste is removed, collected in containers, and transported to the authorized landfill.
- waste water, via the waste water pumping station, passes into the compact grate, sand remover and grease separator units;
- then it passes into the water equalization and pumping basin towards the biological reactors from where, on two paths, it passes into the purified water compensation basin;
- after the discharge of waste water, a decisive technological phase in a sewage treatment plant is the technological management of the resulting sludge, passing through the following successive stages:
 - stabilization;
 - thickening;
 - mechanical drying.

The resulting sludge goes to the sludge deposit from where, following the analyses and results obtained, it is transported:

- either as fertilizer in agriculture;
- or in specific warehouses for neutralization.

All these operations and stages (Figure 1) represent a properly functioning sewage treatment plant and require a considerable area of land, an area that was not available to the Daia Română Administrative Territorial Unit from Alba County due to land fragmentation and their transfer to private ownership for other uses.

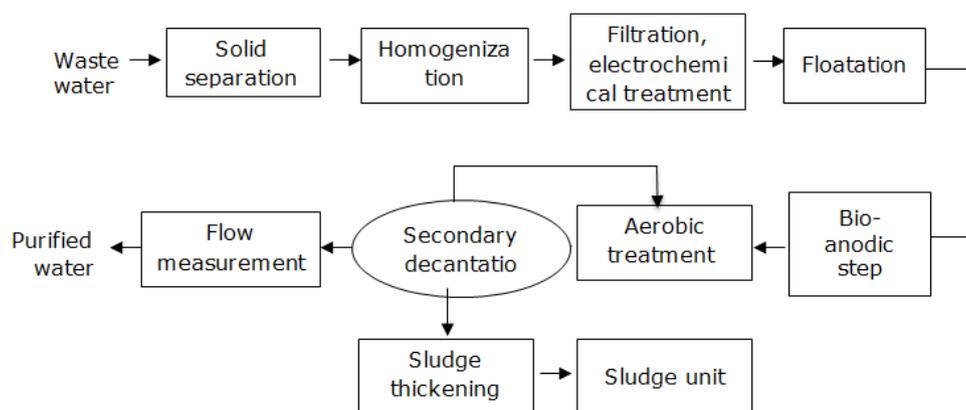


Figure 1. Technological scheme of waste water treatment.

Downstream, on the course of the Daia stream (discharge channel), there is a fish farm, managed by SC Delta Plus SRL, made up of ponds, breeding and reproduction basins; also, very close to the Daia Română commune, the largest Daia 1 Pond (upstream) with an area of over 35 ha is to be found (Expertise file 611/P/2021).

The Daia fish farm was developed by blocking the water course of the Valea Daia stream, downstream from the Daia Română locality. The implementation of the Valea Daia Fish Farm was carried out on the basis of Project no. 700/1978 of I.C.P.D.D. Tulcea, under the command of the Cluj-Napoca Fisheries Company. According to the data from the Water Management Authorization no. 99 of 27.04.2010, "The development of the Valea Daia Fish Farm was carried out in 1987, by damming the minor bed of the Daia Valley stream, downstream from the Daia Română locality. The total landscaped area is 109.54 ha, of which 74.2 ha is water gloss. The purpose of the development is the production, processing and marketing of fish, with a production capacity of 120-140 tons of fish/year" (Water Management Authorization no. 99/2010).

The lack of land of the Daia Română Administrative Territorial Unit led to the location of a hybrid sewage treatment plant SE2 in the very center of the commune and a secondary sewage treatment plant SE1 located downstream - about 800 m from the entrance to the Daia Română commune. The technology applied in the design, execution and functioning of the stations was limited by the lack of available spaces.

Between the Daia Română (built-up area) commune and the fish farm, all the lands have been retroceded (Figure 2) with owners being natural persons or individual enterprises of agricultural interest or industrial production.

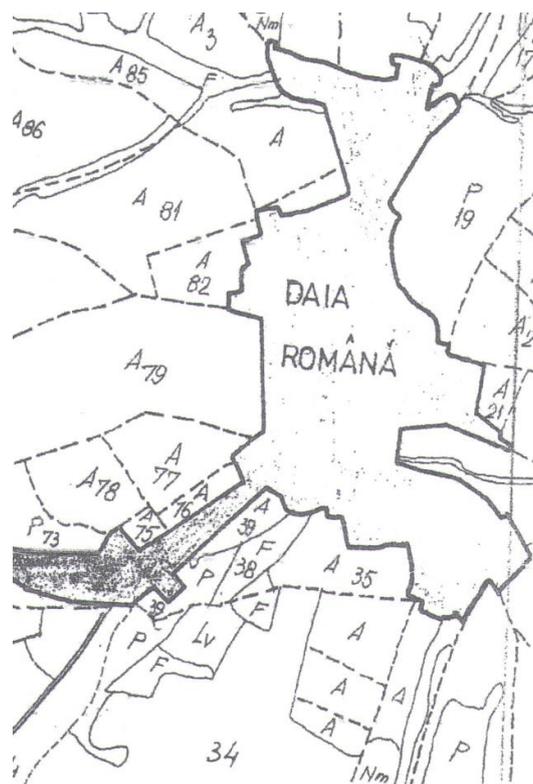


Figure 2. Extract from the General Plan - Water Management Authorization no. 99/2010 for the development of the Valea Daia Fish Farm (Water management authorization no. 99/2010).

The project executor has chosen a fortuitous solution that led to the creation of a hybrid station, without taking into account the occurrence of exceptional, meteorological and pedological risk situations, and without carrying out an Environmental Impact Assessment (EIA) regarding the influence of the functioning of these Sewage treatment plants on the companies that perform agricultural production activities or the fisheries located downstream from Daia Română commune, Alba County. The fish farm, according

to what is written above, has been functioning since the 1980s and it is composed of several lakes, the largest, in terms of surface area, being the Daia 1 Pond (upstream), covering over 35 ha.

An EIA is a process designed to identify and estimate, in accordance with the legislation in force, the direct and indirect, synergistic or cumulative, main and secondary effects of the project on human health and the environment (Emergency Ordinance no. 195/2005). The impact assessment establishes the measures to prevent, reduce and, where appropriate, compensate for significantly adverse effects on the environment and contributes to the decision to issue/reject the environmental agreement. Taking over the sewerage and waste water treatment by an economic operator implies taking over all the responsibilities generated by this activity. The economic operator is responsible for carrying out sewage treatment in accordance with the operating authorizations issued by the relevant Romanian authorities (National Administration of Romanian Waters, in the current case ABA Mureș-SGA Alba, Ministry of the Environment-A.N.P.M. Environmental Protection Agency-Alba County) (Government Decision no. 188/2002; Council Directive 91/27/CEE).

Due to the lack of the necessary areas to create sludge storage tanks, sludge that had to be continuously evacuated, the slightest delay combined with the pluvial condition (weather conditions), led to a real ecological disaster. It should be mentioned that the sludge from the so-called "sludge platform", very limited in surface, due to lack of space, had to be evacuated at a distance of over 18 km (Water Management Authorization no. 99/2010). Thus, following rainy periods from April to May 2017, rainwater with considerable flow rates caused the sludge platform to be washed into the bed of the Valea Daia stream (outlet) and the pollution shock was discharged into the Daia 1 Pond (upstream), with an area of 35.5 ha of water, causing a fish mortality of almost 40.0 tons of fish (Figure 3), according to the documents drawn up by the specialized institutions (Expertise file no. 611/P/2021).

Considering the inefficiency of the existing sewage treatment plant, the two sewage treatment stations were entirely abolished. Thus, instead of the sewage treatment plant SE2, a pumping station and a domestic-fecaloid waste sewage network was formed from the Daia Română commune to the waste water transport pipeline of the Lan crăm commune (approx. 10-15 km), in order to be transported to the Sebeș Treatment Plant, Alba County. Both the Lan crăm Transport Pipeline and the Sebeș Sewage Treatment Plant were functional for a long time.

In conclusion, the cause that determined the technological mistakes in the design, execution, operation of the sewage treatment plants was the lack of the necessary space as a result of land fragmentation. If a location downstream the Daia fish farm was to be found, a well-sized space depending on the type of sewage treatment plant, the fish fauna in the facility would not have been fatally affected in case the event occurred.



Figure 3. The Valea Daia stream feeding the pond; May 2017 – fish mortality.



Figure 4. Daia Română locality, satellite map.

Following the satellite map provided by O.C.P.I and APIA (Expertise File no. 611/P/2021), it can be clearly seen that, following land transfers and the application of special laws, the entire area of land in the Daia Română Administrative Territorial Unit, whether it is urban or rural, between the area of houses and the Daia fish farm is fragmented into parcels, properties belonging to natural persons.

The event that occurred - the mortality of 40.0 tons of fish from Daia 1 Pond (upstream), caused by the discharge of water and sludge into the discharge (outlet) channel, as a result of the collection of waste water, the washing of the sludge platform by the rain, undoubtedly led to the triggering of some criminal investigations, expertise, trials in Courts regarding responsibilities, penalties, compensations. This, without taking into account the material damage caused to the fish farm (Expertise File no. 611/P/2021). All of this could have been prevented if there had been a surface of land downstream of the Daia fish farm, land belonging to the Daia Română Administrative Territorial Unit, on which the sewage treatment plant of the commune would have been located. The lack of analyses, as well as the lack of a crisis management plan caused by the incompatibility of the sewage treatment plant in achieving the objectives in full, for which the investment was invoked, produced a lot of harm, as can be seen from the multiple analyses and reports in the case file (Expertise File no. 611/P/2021).

As the lands were retroceded, they were fragmented, being no possibility of land transfer in order to obtain the surface necessary for the investment, with a feasible project that would totally eliminate risks of this kind.

Case study no. 2: The Sigmir fruit farm and fish farm from the Bistrita Năsăud County, Romania. Another situation in which land fragmentation has led to deficiencies and litigious situations is found in Bistrita Năsăud County. In the years 1970-1980, I.A.S. Bistrița built up the Sigmir Fruit Farm, right in the vicinity of Bistrița municipality (Expertise File no. 9304/190/2010**). In those years, having the necessary conditions, an 18 ha water reservoir was created in the orchard tank fed by springs and rainwater accumulations from the slopes for an optimal functioning of the orchard (Figure 5).



Figure 5. Expertise images from 2021 from the Fruit farm-Fish pond arrangement from Sigmir (Bistrita).

The water accumulation made up of three basins of different sizes, had a double role:

- as a primary role - water reserve for fruit tree irrigation in accordance with the prescribed technologies;
- as a secondary role – stocking with fish, also becoming a recreational area over time.

The surfaces of water bodies (gloss), lakes, were created according to some projects that were very widespread in the 70s of the last century by the existing I.A.Ss through fruit or wine farms in the entire Transylvanian area, farms still present today in Mureș, Cluj, Bistrița Năsăud, Sălaj, Alba, Bihor counties. The main role of these water bodies, lakes, was either to protect against floods and to control the phreatic level of the waters coming from springs, streams, rainwater from the slopes, etc., or they were used for orchard irrigation, especially the irrigation of young plantations. According to the provisions and the customs of those times, next to these pools - created bodies of water, rest areas for working people with terraces, cabins and wooden houses were placed. In the naturally or artificially formed reservoirs (accumulations of water) fish fauna developed. If during the communist period relaxation and fishing in these lakes created in Fruit farms were activities allowed to certain people, after 1990 these types of activities became a business opportunity, a commercial activity of Aquaculture and Recreation - including sport fishing (Expertise File no. 9304/190/2010**). This observation is visible and undeniable: the entire work is a fish pond.

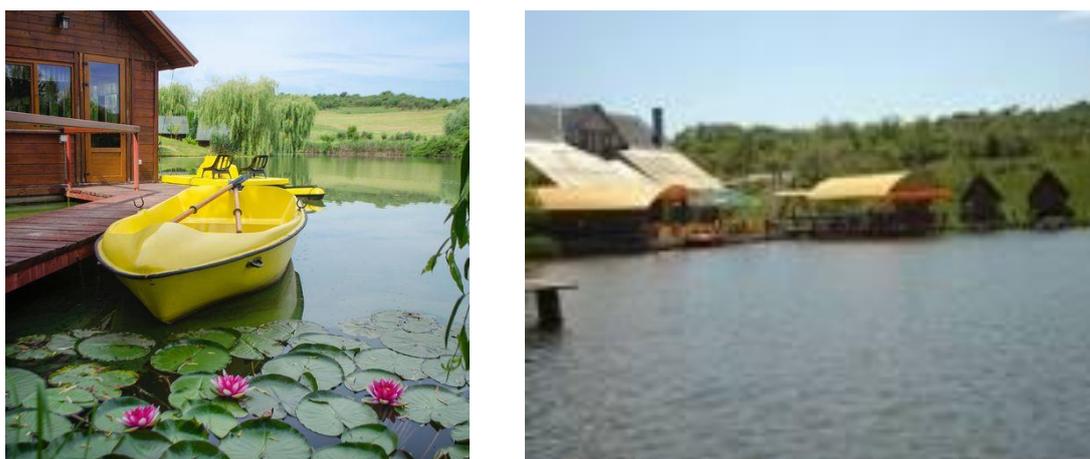


Figure 6. The Sigmir fish farm (Source: www.pescuitul.eu).

It should be noted that without these facilities, it is very easy to find that the entire area would be empty of water, which, in spring-autumn conditions, by collecting rainwater from the slopes, could create flooding both on the present surface and downstream. By combining the two objectives, the Sigmir fruit farm area together with the fish farm - as

breeding, sports and recreational fishing area, the Sigmir fruit farm became a profit center, with a profitable economic activity.

Through the retrocession of lands to former owners (Land Fund Law no. 18/1991) and their descendants, before nationalization, the lands belonging to I.A.S. Bistrița, that became SC Agroindustrială SA Bistrița, the phenomenon of land fragmentation appeared resulting in the dismantling of the Sigmir fruit farm.

A number of four natural persons would have been the beneficiaries of the lands under the water surface, which would have led to the abolition of the Ponds, with a double use: water reserve, but especially a fish farm, with interest in the growth, production and exploitation of fish for consumption and after 1998 with interest for leisure and recreational fishing (sport fishing) (Expertise File no. 611/190/2010**). The request of natural persons was to be put in physical possession with land in share with the documents they had (Figure 7). As a rule, almost all lands in our country with possibilities of flooding are favorable for fish farms. Ponds can be set up in agricultural areas located on flat land; in the same way marshes covered with reeds can also be drained, cleared and transformed into ponds. Degraded, unproductive lands can also be adapted, under certain conditions, to fish farms.

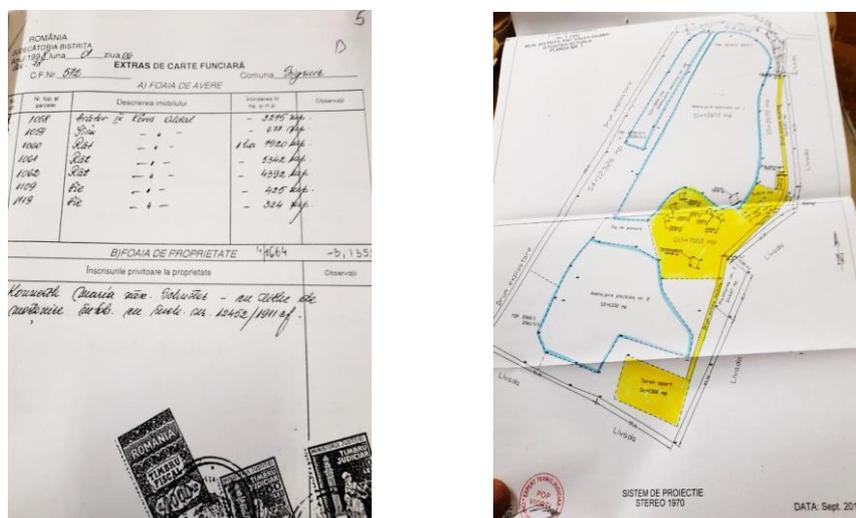


Figure 7. Land register extract from 1998; Situation plan made by an expert in 2010.

In general, land that is good for agriculture can also be used for fish farming provided that there is water supply (Expertise File no. 9304/190/2010**). As a result of intense industrialization, agricultural chemicalization, transport development, the growth and modernization of populated centers, environmental pollution is inevitably recorded in our country as well (Emergency Ordinance no. 195/2005; Government Decision no. 188/2002). The intensification, expansion and diversification of pollution raise particularly complex problems which are difficult to solve in relation to the changes they produce in the aquatic ecosystems. Similar aspects are also recorded for other aquatic ecosystems, in the areas located downstream of household or industrial waste discharges of various types (sugar factories, synthetic fiber manufacturer factories, oil industry, even in highway construction areas, etc.) As can be observed from Figure 8, images taken by experts on the spot in June 2021, in the area of the Sigmir ponds there is a lot of greenery, trees, shrubs, willows, even water lilies, the entire area being fenced off with a wire fence fixed on poles of concrete (Expertise File no. 9304/190/2010**).



Figure 8. Expertise images from 2021 from the Sigmir Fruit - Fish farm (Bistrița).

As shown above, "pollution" is considerably reduced, the area is environmentally protected from urban pollution. In conclusion, water accumulation was created within the Sigmir fruit farm, belonging to I.A.S. Bistrița, from a cadastral plot of 41,500 hectares (Figure 9) over 300 ha represent the surface of the farm, while 17 ha the water reservoir.

EXTRAS DE CARTE FUNCIARA pentru INFORMARE
 ANCEP
 Oficiu de Cadastru și Publicitate Imobiliară BISTRITA-NASAUD
 Birou de Cadastru și Publicitate Imobiliară BISTRITA

A. Partea I. DESCRIEREA IMOBILULUI
 Adresa: ...
 Nr. de obiectiv / nr. de cadastru: ...
 Suprafața (m²): ...
 Observații / Referințe: ...

B. Partea II. PROPRIETAR AL ACTE
 1885 / 15.06.2013
 Hotărâre Judecătorească nr. 1887, din 23.11.2010, emisă de TRIBUNALUL BISTRITA NASAUD
 81 Intabulare, drept de PROPRIETATE, întabulat cu înch.nr.2833/2006 în baza sentinței civile nr.1184/2004 cf. a încheierii de întabulare a amănunții vădită din sentința, dobândit prin HOTĂRÂRE JUDECĂTOREASCĂ, cota actuală 1 / 1
 21 STATUL ROMÂNIA
 814 se notează acțiunea civilă și completarea ei acțiune, înregistrată la Judecătoria Bistrița sub nr.2304/190/2010 întocmită de SC ARTECU TUR SRL cu sediul în Livezile Bistrița, Comisia Locală pentru Stabilirea Dreptului de Proprietate asupra Terenurilor din Bistrița, Comisia Județeană pentru Stabilirea Dreptului de Proprietate asupra Terenurilor SRL, notată cu înch.nr.2159/2010 în baza acțiunii în instanța nr.2024/190/2010 din 25.10.2010, registrul cadastral al proprietarilor nr.2024/190/2010 din 23.10.2010

C. Partea III. SARCINI
 18085 / 15.06.2013
 Hotărâre Judecătorească nr. 1887, din 23.11.2010, emisă de TRIBUNALUL BISTRITA NASAUD
 C2 Intabulare, drept de ADMINISTRARE, întabulat cu înch.nr.2833/2006 în baza sentinței civile nr.1184/2004 cf. a încheierii de întabulare a amănunții vădită din sentința, dobândit prin HOTĂRÂRE JUDECĂTOREASCĂ, cota actuală 1 / 1
 21 AGENȚIA DOMENIILOR STATULUI
 C2 Intabulare, drept de SUPERFICIE
 17 SC ARTECU TUR S.R.L. LIVEZILE, CIF. 11279840

SITUATION PLAN:
 Numele și prenumele proprietarului: SC AGROINDUSTRIALĂ S.A. BISTRITA
 farme pomicole nr. 1
 Adresa: str. Drumul Cetății nr.1, Loc. Bistrița
 SC Agroindustrial SA
 SC Agroindustrial SA
 SC Agroindustrial SA
 Verificat, O.J.G.G.C. Bistrița - Nasaud

Figure 9. Land register extract from 2016; Situation plan drawn up in 2002 by O.J.C. BISTRITA for SC Agroindustrială SA Bistrița.

If the request of natural individuals to be put in physical possession of share of the owned land would have been approved, these Water Reservoirs located in the former Sigmir Fruit Farm would have had to disappear and the Fish Farm should no longer exist. In this situation, in order to avoid the catastrophic effect of land fragmentation, and especially of those involved in an economic activity - Fish Farm - which physically existed before January 2000, retrocessions are made by compensation with lands from other area or by indemnification, in accordance with the Decisions of the Courts.

Art. 4. - (1) For the lands in the outskirts of the localities, former properties of natural persons, which have passed into the ownership of the state in an abusive manner and are included in various hydrotechnical arrangements, water or some other improvements equivalent surfaces made up of the existing reserve at the local commissions are returned, in the conditions of the law, to the former owners or their heirs, and in the

situation where these surfaces are insufficient, from the private domain of the state, from the same locality. In the localities where compensation is not possible, indemnification will be granted to the former owners or their heirs, under the law (Law no.1 from 11 January 2000).

This case precisely highlights the ultra-negative effect of land fragmentation and the cessation of some profitable social-economic activities of community interest.

Article 2. - (1) The provisions of the present law also apply to commercial companies resulting from the division or merger of commercial companies that own agricultural lands in exploitation, as well as to national companies that operate under the authority of the Ministry of Agriculture, Food and Forestry.

(2) Agricultural land is defined as: productive agricultural land - arable land, vineyards, orchards, grapevine nurseries, fruit trees, hop and mulberry plantations, pastures, hayfields, greenhouses, solariums, seedbeds and the like -, those with forest vegetation, if they are not part of forestry facilities, wood-pastures, those occupied with constructions and animal husbandry installations, fish processing facilities and land improvements, technological roads and agricultural exploitation, platforms and storage spaces that serve the needs of agricultural production and non-productive land that can be developed and used for agricultural production.

(3) The provisions of the present law regulate the legal regime of agricultural lands, public or private property of the state, under the administration of the State Domains Agency (Law no. 268/2001).

The request for land retrocession in kind made by the four owners, natural persons, would lead to the drying up of the fish farm, the subdivision of the land and its sale to real estate entrepreneurs. The Agency for State Property Management (S.D.A.) which administers the land surface, by virtue of the law (Law no. 268/2001; Land register extract 2016), should confer similar properties in size and importance. In the case of the Sigmir farm (near Bistrița) - fish farm as well, with recreational activities and sport fishing, the disputed situation is still under court debate for more than 10 years.

Through the two examples, the paper aimed to highlight that land fragmentation, regardless of how or for what reason they occur, most often causes material damage, litigious situations, directly or indirectly through the effects they create.

Conclusions. Through the two examples, the paper highlighted that land fragmentation, regardless of how or for what reason it occurs, most often causes material damage, litigious situations, directly or indirectly through the effects it creates.

Conflict of interest. The authors declare no conflict of interest.

References

Council Directive of 21 May 1991 concerning urban waste water treatment (91/27/CEE).
Expertise File no. 611/P/2021, pending at the Prosecutor's Office attached to the Sebeș - Alba District Court.

Expertise File no. 9304/190/2010**, pending at the Bistrita Court – Civil Section.

Emergency Ordinance no. 195/2005 on environmental protection, with amendments and additions.

Government Decision no. 188 of February 28, 2002 for the approval of some rules regarding the conditions for discharging waste water into the aquatic environment, with amendments and additions.

Law no. 268/2001 regarding the privatization of companies managing agricultural land in public and private ownership of the state and establishing the State Domains Agency.

Law no. 1 from 11 January 2000, regarding the reconstitution of the property right over the agricultural and forest lands, requested according to the provisions of the Land Fund Law no. 18/1991 and of Law no.169/1997.

Land fund law no. 18/1991, with amendments and additions.

Land register extract from 2016 issued by O.C.P.I. Bistrița.

Panaiteescu M., 2011 Tehnici de epurare ape uzate. Îndrumar de proiectare stație de epurare. Editura Nautica, 146 p.
Situation plan drawn up for SC Agroindustrială SA Bistrita in 2002 by O.J.C. Bistrița Năsăud.
Water management authorization no. 99/2010 issued for the development of the Valea Daia Fish farm by ANAR ABA Mureș – SGA Alba.

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