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A POSSIBLE ALTERNATIVE TO MINING IN VALEA JIULUI

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Abstract: *Starting from the interdependence of tourism - mountain environment - rural environment - sustainable development, four solutions are proposed and developed in the work as an alternative to mining in the area: tourist village, medicinal plant and forest fruit processing line, milk processing line, cardboard packaging line.*
Keywords: *Petroșani basin, mountain environment, sustainable development*

1. Introduction

It is appreciated that the modern history of Valea Jiului begins with the exploitation of the coal reserves highlighted in the second half of the 19th century and less is taken into account that this intra Depression of the Southern Carpathians is the depository of some traces of human communities from the most ancient times.

For thousands of years, the population of the area has withstood the vicissitudes of time, leading a steadfast existence under the shelter of the haughtily mountains and impenetrable forests.

The descent of the inhabitants of Valea Jiului from the population of the Dacian kingdom is confirmed by the way of life of the locals, be it the wooden constructions, clothing and occupations, customs, traditions and celebrations.

Over the centuries, the basic, traditional occupation was animal breeding.

A turning point in the destiny of the Depression was the second half of the century. the 19th century, when the springs of *burning stones*, as the locals called the coal from the outcrops, began to become interesting in the context of the increase in the demand for coal by railway transport, steel industry etc.

After a century, starting with the nationalization of June 11, 1948, Valea Jiului experienced the greatest development through a rapid increase in coal production without, however, paying due attention to economic efficiency. Along with this, there is a constant increase in the population and the constructive-building fund.

Another period is the one after 1990, when the extraction and use of coal seem to be condemned by world policies regarding the environment, but also by the lack of a national energy strategy, by the errors committed at the governmental or local level.

So that, not even three decades after this event, the mining of Valea Jiului is in an impasse from which there is hardly any way out.

Much has been written about possible alternatives to mining in Valea Jiului, and more will be written, but almost all the proposals remained on paper or in the unfulfilled promises of officials at all levels.

This work is based on an approach by its authors, a few years ago, which proposed some alternative solutions to the collapsing mining of Valea Jiului.

Although at that time the proposals remained between the covers of a doctoral thesis [1], very well appreciated (author Șt. S. Luca, coordinator M. Georgescu), they were viewed with some scepticism by some, today it seems that they are trying to some of those proposals come to life, although the thesis author was never consulted (the thesis, of course, being a public document). With this article, we want to remind you of a place to take into account.

The work proposes the exploitation of the most precious treasure of this area: the beauty and wealth of the mountains that surround it, but also the ancient customs of the inhabitants of these lands.

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Starting from the general objective, which currently animates the entire community of Valea Jiului: the transformation of the depression into an area favourable to economic development, minimizing/eliminating the region's dependence on the mining industry, a diversification of economic activities and the attraction of new entrepreneurial investments are proposed, the presentation and promotion of Valea Jiului as an attractive and accessible tourist destination, the protection of the environment through actions aimed at the main sources of pollution. The following will present: *A Tourist Village, A Medicinal Plants and Forest Fruits Processing Line, A Milk Processing Line and A Cardboard Packaging Line.*

2. The mountain environment as a generator of alternative activities to mining

2.1. General presentation of the mountain area adjacent to Valea Jiului

Located in the heart of the Southern Carpathians, the Petroșani Depression (fig.1) offers the traveller the harmony created between the majesty of the alpine landscape and the altitudes at which, through the efforts of generations, the natives have managed to build their homes.

Fig. 1. Mountain area of Valea Jiului - overview [2]

The entering to the mountain depression, located in the upper part of Jiu River, is framed by mountains that are part of Parâng and Retezat-Godeanu mountain groups, as follows (fig. 2): to the west and north Retezat and Șureanu Mountains; to the east Parâng Mountains; to the south Vulcan Mountains.

As far as altitude is concerned, the study area stretches between the limits of 400m - 2,519m, the upper limit being the Peak of Parângul Mare in Parâng massif.

The ridges of Parâng, the lakes of Retezat and the plains of Vâlcan Mountains can be admired by hikers on the shepherds' paths and tourist routes.

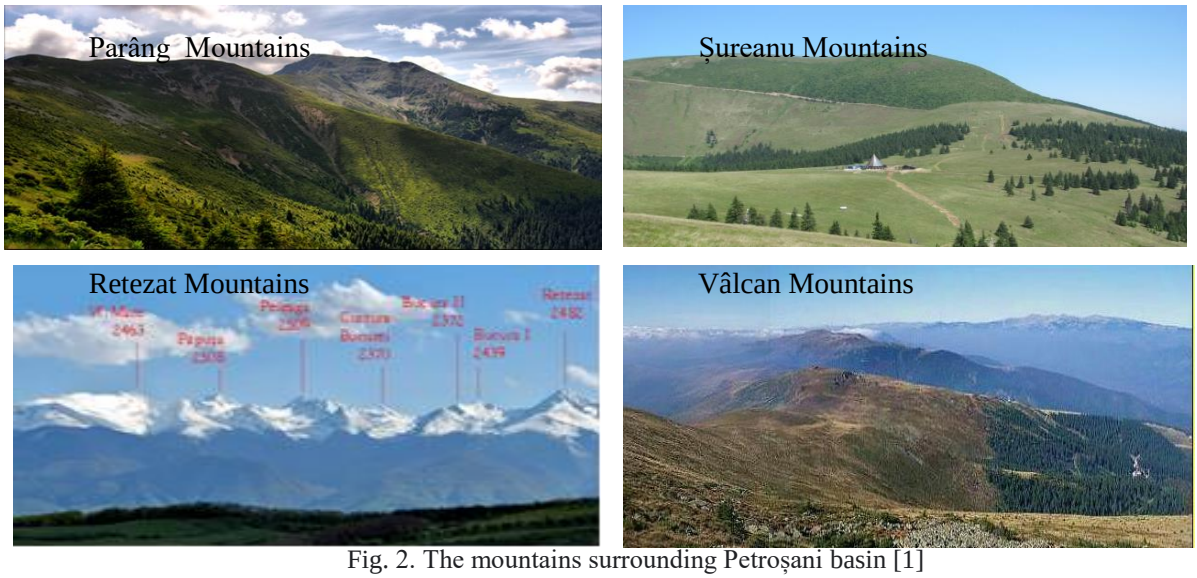

Fig. 2. The mountains surrounding Petroșani basin [1]

In recent years, in the Valea Jiului, investments have been made in mountain tourism infrastructure, some of which are doomed to failure, due to the altitude, the local climate, or the lack of a concept developed according to local conditions.

The different projects, from different areas, sometimes neighbouring ones, did not take each other into account; In some situations, investments in ski infrastructures were made without correlating the development of the resorts with the principles of urban planning, with those of cooperation, and, at the same time, in the absence of a coherent concept of development and strategic zone planning.

The main resources of the mountains surrounding Valea Jiului are represented by the forest fund and biodiversity, by the fodder flora of the natural meadows, by the landscape and by the native anthropic factor, bearer of economic and cultural traditions, decisive for the responsible use of resources.

In this context, the growing interest of foreign tourists in the mountain component of Valea Jiului is due to the diminishing natural attractions and the increased anthropization of the mountain system in the alpine countries of Europe, respectively the high valences of the unaltered environmental factors from Petroşani Depression, a favourable fact for tourist travel, towards their area.

The harmonious presence of different forms of relief and the favourable soil and climatic conditions have enriched and beautified the nature of Valea Jiului with a wide variety of landscapes and favourable conditions for the development of diversified habitats.

Despite an ephemeral and excessive industrial development, from the not-too-distant past of Valea Jiului, the study area still preserves an exceptional natural heritage represented by numerous and extensive areas and reserves protected by law, to be passed on to future generations.

The existence of these protected areas and reserves does not limit human activities in the respective areas, on the contrary, the territorial membership of the new NATURA 2000 network constitutes, for the local population, opportunities to carry out ecological activities and benefit from European funds.

The main advantages of the mountainous area in Valea Jiului are:

- a natural mountain environment, generous, still well forested and with a rich biodiversity;
- dynamic and healthy mountain rural population with a still good percentage of agricultural youth, adapted - the key to development;
- partially preserved economic and cultural traditions;
- minor degree of chemicalisation in mountain agriculture and quality agro-food products, ecological type.

The distribution of the lands of the mountain environment related to the study area is as follows [1]:

• 1A – forests located in the protection perimeters of springs and sources of drinking water, in an area of 1,028ha;
• 1B – forests on the direct slopes of the storage reservoirs, in an area of 1,320ha;
• 1C – forests on the slopes of the rivers and streams that feed the reservoirs, in an area of 10,375ha;
• 2A – forests located on cliffs, on talus, on land with deep erosion, on land with a slope greater than 35^0, in an area of 15,485ha;
• 2B – forests made up of whole plots, adjacent to public roads of particular interest, in an area of 38ha;
• 2C – forest strips around the alpine hollows, in an area of 3003.7ha;
• 2E – forest plantations executed on degraded land, in an area of 28ha;
• 2F – forests located in areas of avalanche formation, in an area of 113ha;
• 2H – forests located on slippery terrain, in an area of 13ha;
• 2L – forests located on land with lithological substrates, very vulnerable to landslides, in an area of 7,103ha;
• 3F – forests located at high altitude in very difficult regeneration conditions, in an area of 5ha;
• 3J – forest strips in the vicinity of tailings deposits, in an area of 108ha;
• 4B – forests around the municipality of Petroşani, Lupeni and the town of Aninoasa, in an area of 260ha;
• 4E – forests with recreational functions, in an area of 300ha;
• 4I - forest strips along tourist roads of particular importance, in an area of 371ha;
• 5A – forests established in Retezat National Park, in an area of 1,932.8ha;
• 5D – forests established in scientific reserves, in an area of 2.0ha;
• 5H – forests set up in reserves for the production of forest seeds, in an area of 447ha;
• 5I – forest areas intended for the protection of rare species of the indigenous fauna (mountain grouse), in an area of 700ha;
• 5J – forest areas intended for the protection of rare species from the indigenous area (black goat), in an area of 200ha;
• 5L – forests established in the buffer zone of Retezat National Park, in an area of 1,171.2ha.

In the work [3], a series of relevant landscape elements and special biotopes in the studied National Parks were established and quantified, the summation of which was rendered through a total score.

The occurrence of these elements was quantified by the numbers:
• 0 - when the element is missing;
• 1 - when it appears sporadically;
• 2 - when it is frequent;
• 3 - when it is encountered very frequently.

These relevant elements and their occurrence, transposed to the characteristics of the mountain environment related to Valea Jiului, are represented by:
• alpine ridges (over 2,000m): 3;
• cirques and glacial moraines: 2;
• long alpine passes: 3;
• mountain pines/alpine bushes: 2;
• steeps/cliffs: 2;
• alpine lakes (tarns, ponds): 3;
• artificial lakes (accumulation):1;
• keys: 1;
• karst reliefs (caves, avenues): 1;
• peat lands, swamps: 1;
• streams: 2;
• lights: 1;
• fragments of quasi-virgin forests: 3;
• massive compact forests: 3;
• monumental trees (secular): 2;
• bear dens: 3;
• biotopes favourable to the black goat: 3;
• biotopes favourable to lynxes: 2;
• eagles' nests: 1;
• turning places for the capercaillie: 3;
• viewpoints: 3.

Comparing the score obtained, respectively 45, to the score obtained by Retezat National Park, respectively 43, and which places it at the head of seven other national parks, it can be said that the mountain massifs that frame Parâng and Retezat-Godeanu Mountain Groups, benefit from all the assets necessary to carry out an organized tourism, within them, and to arouse the interest of the hiker to discover new points of interest.

In the actions that are expected to take place in order to promote and capitalize on the tourist heritage, the following aspects must be taken into account, in accordance with the principles of sustainable development and efficient capitalization of resources:
• minimizing the effects of anthropogenic activities in natural areas with visible tourist objectives;
• maintaining the balance between promotion/utilization and maintaining unaltered natural objectives;
• maintaining the balance between the quality of a natural tourist objective and ensuring the facilities necessary to practice tourism at modern standards of comfort and safety;
• the use of environmentally friendly techniques for tourist infrastructure and services;
• the transition from uncontrolled to organized tourism, which will lead both to maintaining control and minimizing negative effects, as well as to obtaining material benefits for the area;
• promotion of specific mountain sports.

2.2. The relief of the mountainous area suitable for tourist activities

The study area has an extraordinary tourist potential, represented both by the numerous and valuable natural objectives (fig.3 and fig.4) and by the anthropogenic ones (fig.5 and 6). A natural heritage that is hardly exploited is that of sports; the mountain area has all the necessary qualities for practicing specific sports: trekking, climbing, speo-climbing, paragliding, and mountain-bike.

The mountain area constitutes a specific natural habitat, the human habitats integrated into the natural environment also having a distinct specificity. Mountain and alpine ecosystems are fragile, ecologically, due to natural factors such as altitude, meteorological phenomena, soil constitution etc.

Fig. 3. Cave formations with corals [4]

Fig. 4. The hill and the entrance to the Peștera Bolii [4]

Fig. 5. Organized and approved tourist routes in Parâng massif [4]

Fig. 6. Organized and approved tourist routes in Retezat massif [4]

2.3. Flora of the mountain area

The flora and vegetation, present in the mountain massifs guarding Valea Jiului, is stratified according to the climatic zones, as follows: alpine, subalpine and forest strata.

The importance of this area also lies in the centuries-old beech forests, where meet the woody species of hornbeam, birch, red elder etc. At the same time, the landscape impact is particularly impressive. The presence of the ferns *Pteridium aquillinum, Phyllitis scolopendrium*, along with flowering plants: *Asperula odorata, Dentaria bulbifera*, etc. cannot go unnoticed. Alpine meadows are well represented by the species *Nardus stricta, Festuca supina*, sometimes these meadows are interrupted by the mixture of *Rhododendron myrtifolium* and *Pinus mugo*. The presence of the cornflower, symbol of the protection of the natural environment, is also important.

Also in this area, the presence of 1,186 species of higher plants is indicated, of which 62 are endemic species - the genus *Hieracium* (Vulturica) (fig. 7) and as dendrological rarities we mention a population of Scots pine at high altitude, as well as two columnar forms in spruce.

In this area is the only resort in the country where the Balkan-Dacian species *Potentilla haynaldiana* appears, together with other saxole species of Daco-Balkan origin, with which they outline saxole kenoses of particular importance for this area, because they are found only in some mountain massifs of the Balkans.

Fig. 7. Species of Hieracium (Vulturica)

Table 1 presents the types of habitats in the mountain area and makes a global assessment of them according to representativeness, relative area and conservation status [5].

Table 1. The types of habitats in the mountain area and assessment them

Habitat name	Representativeness	Relative area	Conservation status	Global assessment
Herbaceous vegetation on the banks of mountain rivers	B	C	B	B
Mountain meadow	B	B	B	B
Alpine pioneer formations of Caricion bicoloris-atrofuscae	B	B	B	B
Tilio-Acerion forests on steep slopes, screes and ravines	A	B	A	A
Bushes with subartic salix species	B	C	B	B
Boreal and alpine meadows on siliceous substrate	B	B	B	B
Alpine and subalpine calciphile meadows	B	C	B	B
Mountain Nardus meadows rich in species on siliceous substrates	B	A	B	B
Edge communities with hygrophilous tall grasses from plains to mountain and alpine	B	C	B	B
Siliceous screes from the mountain floor to the alpine one	A	A	B	A
Woody vegetation with Myricaria germanica along mountain rivers	B	C	B	B
Alpine and boreal bushes	A	C	B	B
Bushes with Pinus mugo and Rhododendron myrtifolium	B	B	B	B
Luzulo-Fagetumtype beech forests	A	B	A	A
Dacian beech forests (Symphyto-Fagion)	A	C	B	B
Acidophilous Picea abies forests of the mountain to alpine levels (Vaccinio-Piceetae)	A	B	B	B
Rocky slopes with chasmophytic vegetation on siliceous rocks	B	B	B	B
Peat lands with forest vegetation	B	B	B	B
Larix decidua and/or Pinus cembra forests in the mountain region	B	B	B	B

***A**: (almost) isolated population; **B**: non-isolated population, but at the limit of the distribution area;*
***C**: non-isolated population with an extended distribution area*

Therefore, the global evaluation of the value of the site, from the point of view of the conservation of natural habitats, is good and excellent.

2.4. Fauna of the mountain area

The forested areas, and not only, shelter over 150 species of vertebrates and 1,750 species of invertebrates; here we mention the large herbivores (the charnois, the Carpathian deer, the roebuck), as well as the large carnivores (the wolf, the brown bear and the Eurasian lynx) (fig. 8).

Fig. 8. Animals representative of the mountain massifs of the Jiu Valley [1].

Table 2 Shows the faunal species in the mountain area and makes a global assessment of them [5].

Table 2. Mammal species listed in Annex II of Council Directive 92/43/EEC

Species	**Population status of the species**	**Degree of conservation**	**Degree of isolation**	**Global assessment**
Mammalian species				
Canis lupus	C	B	C	B
Ursus arctos	C	B	C	B
Lynx lynx	B	B	C	B
Species of amphibians and reptiles				
Bambina variegata	C	B	C	B
Species of fish				
Cottus gobio	B	A	C	A
Invertebrate species				
Pholidoptera transsylvanica	B	A	A	A
Pseudogaurotina excellens	B	B	A	B

***A:** (almost) isolated population; **B**: non-isolated population, but at the limit of the distribution area;*
***C**: non-isolated population with an extended distribution area*

2.5. Anthropogenic activities currently existing in the mountain area

Due to their position, the mountain massifs that surround Valea Jiului benefit from the presence of national and county roads, roads that, together with the old intramontane notches, constitute real bridges between the depression with its mining settlements and historical areas.

The existence of these roads, as well as the abundance of wood in the area, have led to the development of wood exploitation and processing points in the mountainous area of the depression.

In addition to *the wood exploitation activities*, the *tourism industry* has also developed, especially winter tourism, through the expansion of the two ski areas Parâng (Parâng Mountains) and Straja (Vâlcan Mountains). Thus, works were carried out in order to build new ski slopes, cable car transport lines and accommodation units.

3. SWOT analysis of the potential use of the mountain area for the sustainable development of Valea Jiului

The SWOT analysis, created and used as a tool for formulating strategies in the area of interest, represents an analysis of strengths, weaknesses, opportunities and threats, in order to quickly analyse key strategic points, as well as identify the most viable development solutions socio-economic, taking into account both what Petroșani Depression offers and the lacks of this area (table 3).

Table 3. SWOT analysis of Valea Jiului mountain area [1].

Strengths	- developed transport infrastructure; - the industrial tradition of the region; - available and cheap labour force; - high degree of urbanization of the region; - developed sanitary infrastructure; - the existence of folk craftsmen able to transmit knowledge, traditions and customs specific to young people; - local public administrations with experience in accessing projects with community financing; - the existence of a university centre as well as a pre-university education network that can adapt its grid of specialties to the requirements of the labour market; - the existence of traditionalism in various activities of the population, suitable for the development of the region; - the desire of the inhabitants to carry out different activities even after retirement from the basic occupation (retirement); - the existence of protected areas with large areas; - the existence of several water courses in the depression; - the possibility of practicing different forms of tourism; - natural capital of special value.

Weaknesses	- the decline of the mining area; - mono-industrial area; - labour migration; - poor supply of utilities in the peripheral area; - poor economic development; - weak promotion of the area; - low incomes of the population in the area; - lack of public-private partnerships; - weak manifestation of volunteering; - maintaining some school programs not adapted to the requirements of the labour market; - low number of SMEs.
Opportunities	- accessing the Structural and Cohesion Funds of the European Union; - completion of the connection road Lupeni – Băile Herculane; - qualified and cheap workforce; - the development of niche tourism; - granting fiscal facilities for investors; - natural resources generating new economic activities; - the existence of programs to combat unemployment; - the existence of professional reconversion and retraining centres.
Threats	- social problems generated by the lack of jobs; - decrease in the standard of living; - depopulation of the area; - degradation and pollution of the natural environment; - loss of the specificity of the area, traditions and customs; - the increase in the number of unemployed.

4. Proposals for the development of some activities in the mountain area as an alternative to mining

In the last 25 - 30 years, numerous strategies have been made to keep the Jiu Valley afloat, or others more risky ... *to flourish*, all motivated by the precarious situation of mining in this mining basin. In this way, more and more fanciful projects have appeared, which, on the surface, transform Valea Jiului into a small Romanian paradise. Unfortunately, even the realistic projects remained, for the most part, still on paper, because they all eventually ran into ... financing. Even today, the big investors eager to get rich in these lands have not appeared, as a century and a half ago some foreigners came here to extract... *the black gold.*

The local authorities, if they want to remain in the history of the places they guard, must get involved in these alternative projects, because this time the mining in Valea Jiului will rapidly enter a total collapse.

The solutions proposed by S. Șt. Luca in the work [1] namely: *Tourist village, Medicinal plant and forest fruit processing line, Milk processing line and Cardboard packaging line* we consider realistic and are based on the cultural and mountain richness of these places, where the human factor is capable without a high training to get involved in their realization.

4.1. Tourist village

The tourist village is proposed to be located approximately 20km from Uricani, towards Herculaneum, at an altitude of 1,115m, located at the foot of the Retezat and Vâlcan mountains and on the border of three counties: Hunedoara, Mehedinți and Gorj, with geographical coordinates: $45^0$16'42" latitude N and $22^0$55'29" E longitude in the area known as Câmpul Mielului (fig.9). It will be a rural development, in the mountain area (fig. 10), on an area of 6ha.

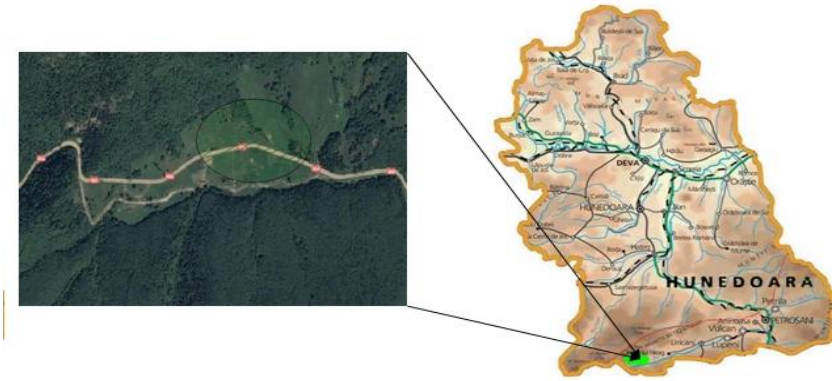

Fig. 9. The location of the Tourist village in Câmpul Mielului area

Fig. 10. Details of the development of the Tourist village

A flat plain, with a superb view towards the heights of Retezatul Mic – Pleşa – Piule and Scocul Urzicarului, crossed by DN 66A, which wants to connect the western part of Valea Jiului with Băile Herculane, represents the ideal place for the construction of a village with a characteristic Momârlan, a village in which , under the coordination of a *tourism company*, ethno-social-ecological principles, the picturesqueness and the functionality of the traditional architecture of Momârlan will be promoted.

In the proposed tourist village, tourists can be accommodated in traditional houses (fig.11), specially designed for them, built by the tourism company. All these houses will provide a minimum of comfort, made with local means, will be furnished in accordance with the classification norms provided in the legislation and will preserve the traditional character of the area.

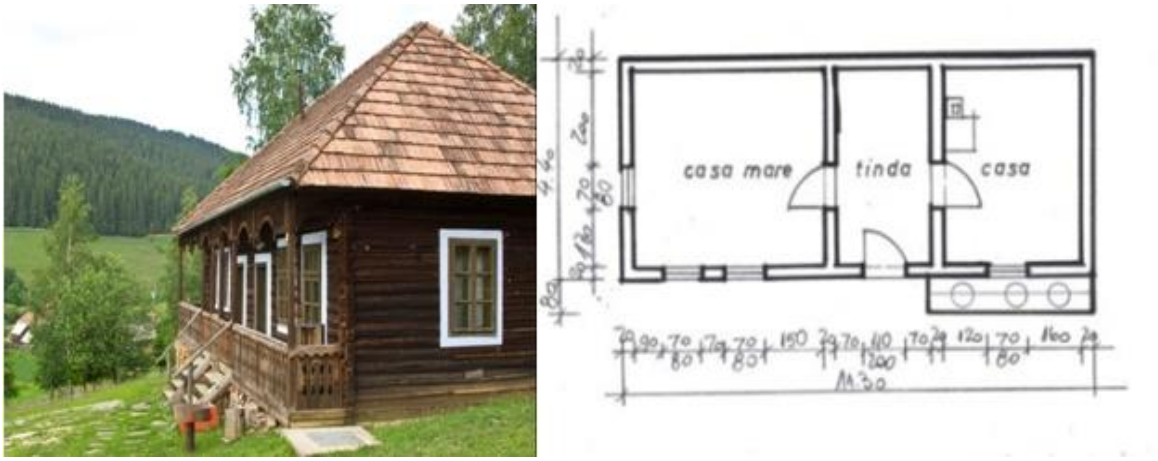

Fig. 11. Traditional house from Momârlan

The village, composed of houses with a reinforced perimeter, a household specific to the depressed area analysed, is small, the predominant constructions being wooden (see fig.11) with a stone base, having inside it a type of pantry between whose walls it keeps a constant, low temperature, useful for keeping food in good condition.

The architecture of the living space and the surrounding space is based on simplicity, on the use of construction materials offered by the studied area, on proportionality and harmony with the surrounding environment and will offer the tourist the specific mountain visual pleasure, the recreational comfort of a peaceful, quiet locality, which offer the possibility for tourists to participate, together with locals (fig.12), in the customs and festivals of the area, which are closely related to pastoral traditions, as well as easy access to the protected natural areas of the two large mountain groups (Parângul and Retezat - Godeanu), which enjoys a great geological, hydrological and florist-fauna diversity.

Fig. 12. Rural activities [6]

The selection of the area was made taking into account several criteria:

- natural conditions;
- socio-economic conditions;
- substructure;
- legislation and regulations in force;
- the baggage of traditions and history of the area.

For a more correct evaluation and a faithful image of the area, a complete and complex way of defining the attractiveness of a territory was used, namely the "TECDEV" method (table 4) [7], a method in which the ***attractiveness index*** (**I**) it is given by the sum of the products of the grade awarded and the weight of the respective component

$$I = \sum q_i \cdot c_i \quad (1)$$

where:

q_i - weight of each component (element, resource) *i* out of a total of *n* components;

c_i - the qualitative level of component *i*;

$\sum q_i = 100$

$c_i \in [0;10]$

The qualitative level of elements (c) is represented by a grade that varies between the following limits:

[0 – 2) - insufficiently attractive resource
[2 – 5) – sufficiently attractive resource
[5 – 8) - attractive resource
[8 – 10) - very attractive resource

Following the analysis *of the attractiveness coefficient, it results that the attractiveness index of the real resort is higher than the attractiveness index of the standard resort*, from which we can draw the conclusion that the real resort is attractive from a tourist point of view, thus justifying the choice made.

Table 4. Analysis of the attractiveness index [8]

The elements of the tourist of	**Share of the elements of tourist offer (%) (q_i)**	**Qualitative level of the reference station (c_{ie})**	**Attractiveness index of the standard resort (I_e)**	**Qualitative level (note) of the real resort (c_{ir})**	**Attractiveness index of the real resort (I_r)**	**Deviation**
1	**2**	**3**	**4=2x3**	**5**	**6=2x5**	**7=6-4**
I. I. The natural environment	**40.0**		**153.0**		**179**	**+26**
relief	10.0		**40.0**		**56**	
diversity	*3.0*	*3*	*9.0*	*8*	*24*	
accessibility	*3.0*	*5*	*15.0*	*4*	*12*	
original	*4.0*	*4*	*16.0*	*5*	*20*	
climate	8.0		**29.0**		**18**	
medium temperature	*3.0*	*3*	*9.0*	*3*	*9*	
rainfall	*2.0*	*5*	*10.0*	*2*	*4*	
air currents	*1.0*	*4*	*4.0*	*1*	*1*	
no. of sunny days	*2.0*	*3*	*6.0*	*2*	*4*	
hydrography	5.0		**15.0**		**17**	
rivers	*2.0*	*5*	*10.0*	*4*	*8*	
lakes	*2.0*	*2*	*4.0*	*4*	*8*	
waterfalls	*1.0*	*1*	*1.0*	*1*	*1*	
flora	6.0		**27.0**		**27**	
diversity	*3.0*	*5*	*15.0*	*5*	*15*	
aesthetics	*3.0*	*4*	*12.0*	*4*	*12*	
fauna	6.0		**18.0**		**24**	
diversity	*4.0*	*4*	*16.0*	*5*	*20*	
degree of danger	*2.0*	*1*	*2.0*	*2*	*4*	
purity	5.0		**24.0**		**37**	
air	*2.0*	*5*	*10.0*	*8*	*16*	
water	*2.0*	*5*	*10.0*	*8*	*16*	
soil	*1.0*	*4*	*4.0*	*5*	*5*	

II. Material structures	**25.0**		**88.5**		**84.75**	**-3.75**
accommodation	10.0		**35.0**		**43.5**	
quantitative	7.0		**20.0**		**28.5**	
diversity	*1.5*	*2*	*3.0*	*2*	*3*	
capacity	*2.0*	*4*	*8.0*	*4*	*8*	
location	*2.0*	*3*	*6.0*	*5*	*10*	
aesthetics	*1.5*	*2*	*3.0*	*5*	*7.5*	
qualitative	**3.0**	**..5**	**15.0**	5	**15**	
of food	4,0		**12.5**		**11.25**	
quantitative	**3.0**		**9.5**		**7.25**	
diversity	*1.0*	*3*	*3.0*	*3*	*3*	
capacity	*1.0*	*4*	*4.0*	*3*	*3*	
location	*0.5*	*3*	*1.5*	*3*	*0.75*	
specific	*0.5*	*2*	*1.0*	*3*	*0.5*	
qualitative	**1.0**	**3**	**3.0**	4	**4**	
of transport	3.0		**11.0**		**2**	
on the cable	*2.0*	*4*	*8.0*	*0*	*0*	
on wheels	*1.0*	*3*	*3.0*	*2*	*2*	
leisure	8.0		**30.0**		**28**	
by day	**5.0**		**21.0**		**25**	
sport	*3.0*	*5*	*15.0*	*5*	*15*	
entertainment	*2.0*	*3*	*6.0*	*5*	*10*	
nightly	3.0	3	**9.0**	1	**3**	
III. Infrastructure	**15.0**		**68.0**		**45**	**-23**
of access	7.0		**30.0**		**9**	
railway	*3.0*	*4*	*12.0*	*0*	*0*	
road	*3.0*	*5*	*15.0*	*3*	*9*	
aerial	*1.0*	*3*	*3.0*	*0*	*0*	
naval	*0*	*0*	*0*	*0*	*0*	
power supply	**8.0**		**38.0**		**36**	
water	*3.0*	*5*	*15.0*	*5*	*15*	
electricity	*3.0*	*5*	*15.0*	*5*	*15*	
combustible	*2.0*	*4*	*8.0*	*3*	*6*	
IV. Superstructure	**10.0**		**36.0**		**36**	**0**
general	4.0		**12.0**		**12**	
of organization	*2.0*	*3*	*6.0*	*3*	*6*	
guard	*2.0*	*3*	*6.0*	*3*	*6*	
tourist	6.0		**24.0**		**24**	
of organization	*3.0*	*4*	*12.0*	*5*	*15*	
guard	*3.0*	*4*	*12.0*	*3*	*9*	
V. The economic environment	**5.0**		**14.0**		**13**	**-1**
the primary sector	1.0	2	**2.0**	2	**2**	
the secondary sector	1.0	1	**1.0**	1	**1**	
the tertiary sector	3.0		**11.0**		**10**	
of consumption	*2.0*	*4*	*8.0*	*4*	*8*	
of production	*1.0*	*3*	*3.0*	*2*	*2*	
VI. The cultural environment	**5.0**		**13.0**		**34**	**+21**
cultural events	2.0	3	6.0	7	14	
Built heritage (monuments, museums, churches, fortresses, etc.)	1.0	3	3.0	4	4	
Unbuilt heritage (folklore)	2.0	2	4.0	8	16	
T O T A L	**100.0**		**372.5**		**391.75**	**+19.25**

So, this method of determining the degree of attractiveness of a resort allows us (table 5):

- ✓ establishing the price policy;
- ✓ viable comparisons between the different tourist resources components of a resort;
- ✓ establishing a hierarchy of tourist resources in terms of their attractiveness with obvious consequences on their capitalization strategy.

Table 5. Business sheet for *tourist Village* [9]

No.	Chapter	Explanations
1	The field of business	Rural tourism
2	CAEN code	5520
3	Type of main activity	Accommodation facilities for holidays and short periods
4	Location	West of Valea Jiului (Uricani – Câmpul Mielului)
5	The type of investment	New investment
6	The duration of the investment	6 months
7	Initial investment value	approx. 600,000 Euros
8	Description of the investment	Executed by the enterprise with local materials, of good quality, preserving the specificity and traditionalism of Momârlan; local people will be employed in this activity. The village will be composed of 20 houses, each with a central heating system, a cellar, a ground floor with a kitchen, a bedroom and a bathroom. The courtyard will have an area of 300m^2, where flower beds and relaxation space will be arranged. A religious place will function within the village where services and rituals specific to the area will take place.
9	Description of services offered	The main services that the settlement offers are: accommodation, ecotourism and traditional activities in which the tourist actually participates Type of accommodation No. houses Total accommodation places Double room.....20.....40 Room with one bed.....20.....20 Total.....20.....60
10	Hierarchy of activities in time, until the start of service provision	- the settlement and construction project; - obtaining all approvals for construction; - the start of construction; - reception of the tourist village; - obtaining all the approvals necessary for the operation of the settlement; - commissioning; - marketing and promotion activities.
11	Estimating the necessary human resources	-1 administrator; -1 receptionist; -3 waiters; -1 bartender; -10 gardeners; -5 caretakers; -2 chefs; -2 guides; -2 installers; -1 electrician; -1 event organizer
12	Market description product	The desire to expand and spend free time and vacations "in the country" is an old concern, especially for nature lovers; at the same time, rural tourism includes the actual tourist activity (accommodation, tourist circulation, running of programs), economic activities (predominantly agricultural but also the practice of some traditional occupations), as well as the way of spending free time for those who request this type of tourism. At the same time, ecotourism is defined as a form of tourism in which the tourist's main motivation is observing and appreciating nature and local traditions directly related to nature.
13	The market of potentials customers	Potential customers are represented by residents of crowded cities in the country and abroad attracted by the surroundings of the settlement, their picturesqueness and the traditionalism of the activities
14	The description competitor	The competition being numerous, we will aim to create a warm atmosphere, in which you feel "at home", adopting a friendly attitude as well as offering a diversified and original service package.
15	The marketing of products	Promotion aims to create/form a positive image of the area, the settlement and the products offered. The services of a printing press will be used for the creation of advertising materials, and the promotional packages as well as the activities carried out within the establishment will be made known through the media channels
16	The planned distribution system	The services will be offered on a reservation basis, for groups of people and traditionally delimited periods. The facility will collaborate with travel agencies.
17	The impact on the environment	All ecological and environmental norms will be respected
18	Permanent employees	40

The main purpose of the activity within the museum, and implicitly of the proposed village, is to preserve an archaic world characterized by simplicity and beauty and to highlight the cultural valences of a civilization whose roots are inscribed in antiquity.

In this sense, it will be considered that the activities of the village are carried out cyclically and in close accordance with the tradition and culture of Momârlan, based on their ancestral calendar; calendar in which we observe:

- community traditions, with a fixed or variable date:

- winter traditions (Christmas carols, Craii, Pițărăii, Goat, Star, Assembly of sheep, Game of the bear, Plugusorul (Plow), Sorcova, Stretenia, Flowering horn, Smoking snakes etc.);

- spring traditions (Holy Week, Spring Transhumance, Flowers, Shouting over the Village, Good Friday, Stations of the Cross, Easter, Easter Watering, Running of the prosphora, Easter Alms, Nedeeas, Pentecost, Spring fairs, Sheep measuring etc.);

- summer traditions (Sheep´s crown, Sanzienele, Fasting of the Dormition, Day of the Cross etc.);

- rites of passage - closely related to the social life of the individual (birth, baptism, cutting of the child's toupee, brotherhood of the cross, engagement, wedding etc.);
- other customs (traditions related to the spruce, moonshine get-together, agricultural rituals, medical traditions).

At the same time, within this location, a place of worship will also function (fig.13) where services will be held on the occasion of various events, from the everyday life of the neighbouring Momârlan community. The place of worship will be a wooden construction, and the architectural style will respect the traditionalism of the place and will fit into the landscape of the proposed area.

Fig. 13. Traditional place of worship [1]

4.2. Processing line of medicinal plants and forest fruits

A general look at the flora of the mountains that make up Parâng and Retezat - Godeanu mountain groups, shows us that almost half of it is composed of elements specific to the European and Eurasian flora, and in a fairly large proportion (approx. 12%), of endemics Transylvanian.

A noteworthy phenomenon of the mountains that surround Valea Jiului is that they separate and almost hermetically isolate each other, so that the diversity of the flora and its uniqueness is specific to each area.

Their geological composition, with a history that starts from ancient times, shows us a diversity of rocks, passing from the granitic blocks specific to the Retezat mountains to para-gneisses, mica-schist, different types of sandstones and crystalline limestone specific to the mountains of the Parâng mountain group.

The mix formed by the geological diversity, the existence of the rocky soil - free of silt and the soft soil, to which two key factors add: light and water, is the generator of a vegetal carpet compartmentalized, horizontally, starting with the area of agricultural plants and continuing through the tiering depending on the areas climates specific to the altitudes. Also thanks to this amalgam of permanent factors, associated with temporary factors (frequency of clouds, temperature fluctuations), we find the same species of plants on soils with different microclimates, plants that, adapting to different conditions, give birth to new forms of flora specific to the mountains that surrounds Valea Jiului.

Their properties being known, there is a long tradition of using medicinal and aromatic plants by the inhabitants of the area in question.

Starting with the century 19th century, the medicinal plants, used until then, moreover, traditionally begin to form the object of research with the aim of establishing whether or not they have an important role in the therapeutic activity attributed by empirical medicine and to specify which the responsible substances of this action are.

So that from the surface of the mountainous massifs, to which we refer, a surface that totals over 44,000 ha, having as species: resinous 45%; beech 50%; various countries 4%; various soft 1%, tens of tons of mushrooms, blueberries, rose hips, raspberries and hawthorn were harvested.

From the examination of the list of plants that were the object of such research and whose use was justified, it is easily seen that it includes numerous species used by the inhabitants of these places since the most remote times.

The range of medicinal and aromatic plants, from the spontaneous flora, as well as some of their characteristics, specific to the mountain area of Valea Jiului (table 6), indicate the reference area as an area suitable for the development of organized crops and a line for their processing.

Table 6. Medicinal and aromatic plants specific to the mountain area of Valea Jiului
Source: *Dictionary of medicinal plants (Eugen Fischer-GEMMA PRES)*

No.	Name of plant	Propagation	Indications
1	Afin/Blueberry/ Vaccinium myrtillus L.	pastures, calcareous meadows, wet or dry mountain plains	diarrhoea, chronic bronchial catarrh, whooping cough, rickets, scrofula, removes water from tissues
2	Arnică/Arnica/ Mountain arnica	mountain plains clearings	stimulates the nervous system and circulation, activates breathing, stimulates the elimination of urine and perspiration, treating nerve diseases, epilepsy, mental illnesses, malaria, dysentery
3	Brustur/Burdock/ Aratium lappa L.	roadside, next to fences	diuretic, sudorific, depurative, laxative, leaf tea is indicated for arthritis, gout
4	Cimbrișor/Thymer/ Tymus serpyllum L.	glades with dry soil, forest glades, in the mountains, on the rocks	treatment of cough, whooping cough, kidney and liver disorders, painful periods, headaches, migraines, dizziness and nausea, anaemia, liver, kidney and bladder disorders
5	Coacăz negru/Black currant/ Ribes nigrum L.	moist forests, the edge of the forest and thickets	treatment of gout and angina, whooping cough, urinary disorders, kidney stones
6	Coada calului/Horsetail/ Equisetum arvense L.	areas with wet and sandy or clay soils	cures hyperacidity, gastritis and ulcers, treatment of tuberculosis, heart, liver and kidney diseases
7	Gălbenele/Marigold/ Calendula officinalis L.	on rocks, shady areas, forest floors	menstrual disorders, persistent vomiting, intestinal worms, diarrhoea, cramps, heartburn, haemorrhoids, warts
8	Genţiana galbenă/Yellow gentian/ Genţiana lutea L.	alpine pastures, on rocks	digestive disorders, liver and spleen disorders, stimulant for the bone system
9	Ienupăr/Juniper/ Juniperus communis L.	alpine pastures, sunny alpine slopes	diuretic, dropsy, chronic rheumatism, gout, tuberculosis in children, nervous disorders, elimination of toxins
10	Merișor/Cranberry/ Vaccinium vitis-idaea L.	Coniferous forests, on hillsides,	bladder disorders, gout, rheumatism, cough
11	Mesteacăn/Birch/ Betula alba L.	deciduous forests, glades, hills and slopes; prefer colder regions	skin diseases, gout, lung diseases, diseases and kidney stones
12	Molid/Spruce/ Picea excelsa	coniferous forests, cold regions	heart and kidney diseases, blood drain, gout, rheumatism, inhalant
13	Mur/Mur/ Rubus fruticosus L.	bushes on the ravines of the forests	diseases of the stomach, intestinal tract, bloating, persistent diarrhoea, enterocolitis, haemorrhoids, leucorrhoea, heavy menstruation

14	Muşchi de piatră/Moss Stone/ Cetraria islandica Acharius	dry mountainous places, in mountain forests of cold and temperate zones	nutritional deficiencies, states of exhaustion, lung diseases, cough, whooping cough, weight loss, intestinal pain, chronic diarrhoea, dysentery, measles
15	Nalbă de pădure/ Mallow/ Malva sylvestis L.	arid hills, ridges, subalpine zone	compresses for eye diseases, dental abscesses, chest pain, laryngitis and tonsillitis, effect, decongestant
16	Păducel/Hawthorn Cratoegus oxyacantha	thickets, bramble-niches, deciduous	mild heart conditions, asthma, obesity, anxiety
17	Păpădie/Dandelion Taraxacum officinale	wide distribution area, up to the alpine area	metabolic disorders, diseases of the stomach, intestines, gall bladder, liver, kidneys and rheumatism, normalization of blood pressure
18	Pătlagina/Plantain Plantaga lanceolata L.	meadows, fields and pastures	depurative, haemostatic, calming, antispasmodic, cicatrizing properties, fights fever, treats catarrh, pulmonary and tuberculosis, respiratory diseases and whooping cough
19	Pătrunjel de câmp/Pimpernel Pimpinella vulgaris	wet meadows and pastures, dry soils rich in limestone	chronic lung diseases, laryngitis, pharyngitis, angina, digestive system secretion disorders, kidney and urinary
20	Plămânărica/ The lung/ Pulmonaria officinalis	deciduous forests, shady banks of streams	tract diseases respiratory tract disorders, hoarse cough, bronchial catarrh, bloody sputum, bladder disorders, haemorrhoids, diarrhoea
21	Potbal/Potbal Tussilogo farfara L	humid forests, scree, alpine plateaus	remedy for respiratory ailments, stomach catarrh, constipation, diarrhoea, gastric secretion disorders, urinary elimination difficulties, oedema
22	Sunătoare/St John´s wort Hypericum perforatum L.	sunny places, forest edges, forest clearings, clearings	effects on the digestive system, anti-inflammatory, effects on the circulatory system (influences circulation and congestive states of various organs)
23	Porumbar/Sloe Prunus spinosa	bushes, roadsides, roadsides, sunny places with gravel	relieves cramps, relieves pain, stimulates the elimination of urine and sweat, is used in eruptions, catarrh of the respiratory and renal tracts
24	Scoruș de munte/Apple tree Sorbus aucuparia	deciduous forests, bushes	depurative juice, in catarrh, cough, gout, rheumatism, lithiasis, stimulates the elimination of urine and perspiration, digestive ailments, vermifuge
25	Strugurii ursului/Bearberry/ Arctostephylos-ursi L.	mountain area, in forests, depressions, mountain slopes	treatment of chronic, inflammatory conditions of the urinary bladder, remedy against cystitis
26	Usturoiul ursului/ Bear garlic/ Allium ursinum	shady and humid deciduous forests	cleans the blood, cures chronic eruptions, hypotensive, stomach and intestinal catarrh, cramps, heart ailments
27	Vulturica/Hawkweed specie/ Hieracium pilosella	glades with dry soil	intestinal catarrh, diarrhoea, hyper menorrhea, wounds, inflamed eyes
28	Zmeur/Raspberry/ Rubus idaeus L.	stony soil, clearings, mountain slopes, fences	stomach and intestinal catarrh, hyperacidity, diarrhoea and hyper menorrhea, menstrual pain
29	Tei/Linden/ Tilia tomentasa	deciduous forests, wet forests, roadsides	stimulates digestion and urine elimination, sedative, vomiting states due to nervousness, colds accompanied by chills and fever

Among the proposed economic activities, with a view to the sustainable development of Valea Jiului, is the establishment of a line for processing medicinal plants and forest fruits, an activity whose specificity must correspond to a typical mountain area.

The implementation of this project is conditioned by the identification of a site for the processing line, a site capable of satisfying several requirements.

Thus, based on the ***accessibility index***, the ideal location was calculated, a location represented by the area of the former poultry farm (table 7 and figures 14 – 16) arranged within the radius of the town of Aninoasa, at an altitude of 560m, more precisely in the area of Iscroni, having the coordinates geographic: $45^0$22'27" latitude N and $23^0$21'3" longitude E, currently disused, located at approx. half the distance between the towns of Valea Jiului, near DN 66A Petroșani – Uricani and DN 66 Petroșani – Tg. Jiu, at the intersection of Parâng and Vâlcan Mountains ranges and the confluence of the East Jiu and West Jiu rivers, the birthplace of the Jiu river.

Fig. 14. Location of medicinal plants and forest fruits processing line

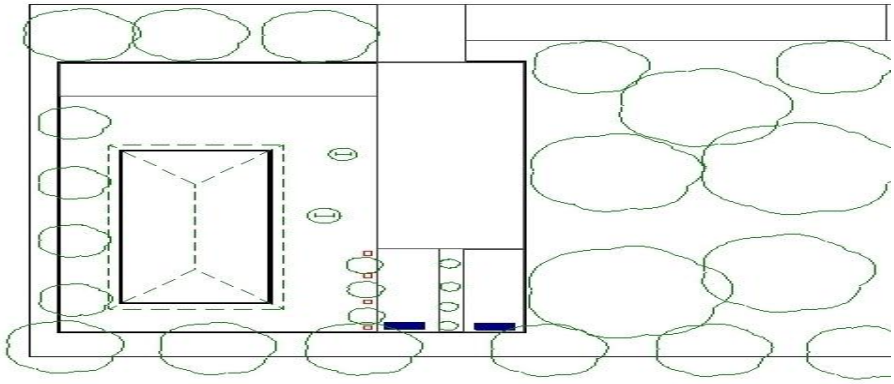
Fig. 15. Plan of processing line of medicinal plants and forest fruits

Fig. 16. Layout of the medicinal plants and forest fruits processing line

The relationship between the location of the active population and the distance between of Valea Jiului localities defines this indicator as edifying for the area's accessibility to activities (table 7).

The formula for calculating the accessibility index is [10]:

$$A_{ij} = \frac{F_j}{d_{ij}^2} \quad (2)$$

where:

A_{ij} – the accessibility index of zone *i* compared to zone *j*;

F_j – the targeted (active) population from area j;

d_{ij} – distance between zone i and zone j;

The global accessibility index of the area is the sum of all accessibility indices:

$$A_i = \sum_{j=1}^{n} A_{ij} \text{ , the number of areas analyzed: 6} \quad (3)$$

Table 7. Calculation of accessibility indices for the towns of Valea Jiului

City / Parameters of calculation		Petroşani	Petrila	Aninoasa	Vulcan	Lupeni	Uricani	Global index, A_i (i=1 ÷ 7)
Active population, F_j		15,536	8,736	1,550	9,584	8,862	3,699	
Petroşani	d^2_{1j}	0	36	49	121	324	625	386.78
	A_{1j}	-	242.67	31.63	79.21	27.,35	5.92	
Petrila	d^2_{2j}	36	0	144	289	625	961	493.51
	A_{2j}	431.56	-	10.76	33.16	14.18	3.85	
Aninoasa	d^2_{3j}	49	144	0	9	121	289	**1,528.66**
	A_{3j}	317.06	60.67	-	1064.89	73.24	12.80	
Vulcan	d^2_{4j}	121	289	9	0	49	169	533.60
	A_{4j}	128.40	30.23	172.22	-	180.86	21.89	
Lupeni	d^2_{5j}	324	625	121	49	0	36	373.08
	A_{5j}	47.95	13.98	12.81	195.59	-	102.75	
Uricani	d^2_{6j}	625	961	289	169	36	0	342.19
	A_{6j}	24.86	9.09	5.36	56.71	246.17	-	

A potential turnover for the valorisation of medicinal plants is given in table 8.

Table 8. Business sheet for *The production of teas and other medicinal plant products* [11]

No.	Chapter	Explanations
1	The field of business	Production of teas and other medicinal products
2	CAEN code Type of main activity	1083 The cultivation of medicinal plants and forest fruits, in an ecological system, the production and marketing of medicinal plant products
3	Location	Aninoasa
4	Investment duration	12 months
5	Initial investment value	approx. 1,000,000€
6	Description of initial investment	The current project aims to establish a production line focused on the creation of several assortments of teas and other specific products, with as raw material the spontaneous flora specific to the mountain environment surrounded by Valea Jiului, as well as the sea buckthorn crops from the waste heaps in the perimeters of the old mining operations. Purchase of the following tools: - technical scale 6-12 kg; -chopper adjusted for a fragment length of 10 mm/grinding mill; - sieve with inner side of the mesh of 3 mm; -analytical balance 500-1,000g; -stainless steel/glass extractor; -plate filters; -filtration installation with polymer membranes, consisting of microfiltration cartridges and 1-2 ultrafiltration cartridges.

7	Product registration	-consulting several nutritionists; -obtaining the optimal recipe; - approval by the Ministry of Health.
8	Product description	- loose teas or tea bags; - tinctures; - medicinal plants in the form of capsules or tablets; - vegetable oils, syrups; - herbal ointments.
9	Time ranking of activities	-space identification; - furnishing the hall, laboratories and administrative staff offices; - purchase of machinery and equipment; -recruitment and personnel selection; - landscaping for planned crops; - installation of equipment, carrying out tests; -commissioning
10	Human resources estimation	-1 administrator; -1 accountant; -1 production engineer; -1 biologist; -1 environmental engineer; -65 skilled workers; -5 caretakers; - variable number of seasonals.
11	Description of competitors	FARES S.A.; Plafar Brașov; Larix Sovata.
12	The impact on the environment	All regulations and legislative norms in force will be respected
13	Anticipated risks / countermeasures	-lack of raw material/prior research regarding the fulfilment of orders throughout the year; -lack of liquidity/strictly drawing up a strict income and expenditure budget focused on the specifics of the months
14	Business sustainability	In the short term, we will aim to penetrate the market with a small but effective number of natural products, making appropriate promotion in order to launch the brand.
15	Permanent employees	75+150 (buckthorn culture)
16	Seasonal employees	Variable number

Considering that in the perimeter of Valea Jiului, following the exploitation of coal and its preparation, waste dumps have resulted that occupy over 350ha of land, in order to supplement the amount of medicinal plants, from the spontaneous flora of the mountain environment, it is proposed that these dumps the cultivation of some plant species that meet the following requirements:
- to have great dissemination power;
- to be a little pretentious to the environmental conditions of the resorts;
- to be fast growing in order to reach the maturity required for production;
- tailings dumps do not require expensive preliminary preparation.

In this sense, for the most complete use of the available land, of the above and underground nutrition space, it is recommended to choose species whose main parts (stem and root) are woody.

The species *Hippophae rhamnoides* (*White sea buckthorn*), a shrubby plant with great ecological amplitude, vigorous growth and strong rooting, was identified as meeting the minimum requirements; its fruits being used in both modern and traditional medicine.

4.3. Milk processing line

The basic occupation of the inhabitants of Valea Jiului was animal breeding; the four mountainous massifs that surround Valea Jiului had a decisive role in their growth. The extensive and rich meadows of these mountains have been exploited since ancient times, so that the mountain was the place where the life of animal breeders was carried out. Moreover, Romulus Vuia mentions the fact that in Parâng massif, as well as on the slope from Valea Jiului of Vâlcan and Retezat Mountains, at an altitude between 1,400m and 1,600m, there were real sheepfolds and several cowsheds.

After the animal census carried out in 2020, the situation of livestock is presented as in table 9.

Observing this substantial increase in livestock in the perimeter of Valea Jiului, it can be stated that the activity of animal breeding has resumed its position as the basic occupation of the inhabitants of the rural area of the Valley, consequently the creation of a milk processing lines.

Table 9. Livestock numbers in Valea Jiului, according to the 2020 census
Source*: County Directorate of Statistics of Hunedoara County*

No. crt.	City	Area of pastures and hayfields, ha	Domestic animal species, heads		
			Cattle	Sheep	C Goats
1	Petroşani	8,048	1,461	2,469	72
2	Petrila	1,100	1,047	3,592	82
3	Aninoasa	1,730	225	394	48
4	Vulcan	3,164	587	897	72
5	Lupeni	3,312	421	2,256	86
6	Uricani	6,459	536	1,818	14
Total		**23,813**	**4,277**	**11,426**	**374**

In order to determine the location of this line, the accessibility index is used, as in the case of the medicinal plants and forest fruit processing line, with the difference that here instead of the active population (F_j) the related livestock will be considered of each locality, potentially existing in 2020. The calculations are summarized in table 10.

Table 10 Calculation of accessibility indices for the location of the *Milk Processing Line*

Parameters calculation \ City		Petroşani	Petrila	Aninoasa	Vulcan	Lupeni	Uricani	Global index, A_i (i=1 ÷ 7)
Efective animals, F_j		4,538	5,283	720	1,702	3,427	2,874	
Petroşani	d^2_{1j}	0	36	49	121	324	625	190.69
	A_{1j}	-	146.75	14.69	14.07	10.58	4.60	
Petrila	d^2_{2j}	36	0	144	289	625	961	145.41
	A_{2j}	126.05	-	5.00	5.89	5.48	2.99	
Aninoasa	d^2_{3j}	49	144	0	9	121	289	**349,16**
	A_{3j}	92.61	36.69	-	189.11	28.32	9.94	
Vulcan	d^2_{4j}	121	289	9	0	49	169	222.72
	A_{4j}	37.50	18.28	80.00	-	69.94	17.00	
Lupeni	d^2_{5j}	324	625	121	49	0	36	142.96
	A_{5j}	14.00	8.45	5.95	34.73	-	79.83	
Uricani	d^2_{6j}	625	961	289	169	36	0	120.51
	A_{6j}	7.26	5.50	2.49	10.07	95.19	-	

Following the calculation of the accessibility indices, it follows that the Aninoasa locality represents the most favoured area, from this point of view, for the proposed activity, but the present work having as its purpose a distribution, in the perimeter of Valea Jiului, of the proposed activities, and taking into account the fact that the pasture area (12,935ha) of the western area of the valley (Uricani, Lupeni, Vulcan, Aninoasa) is smaller than that of the eastern area (Petroşani, Petrila, Bănita) which totals an area of 14,752ha, ***it is proposed that the line milk processing plant to be located in the town of Petrila,*** at an altitude of 556m, in the vicinity of the intersection of DJ 709 K and DJ 709 H, with geographic coordinates $45^0$27'1" N latitude and $23^0$24'3" E longitude (fig. 17 - 19) at the confluence of the Taia and Jieţ streams, the birthplace of the **East Jiu river.**

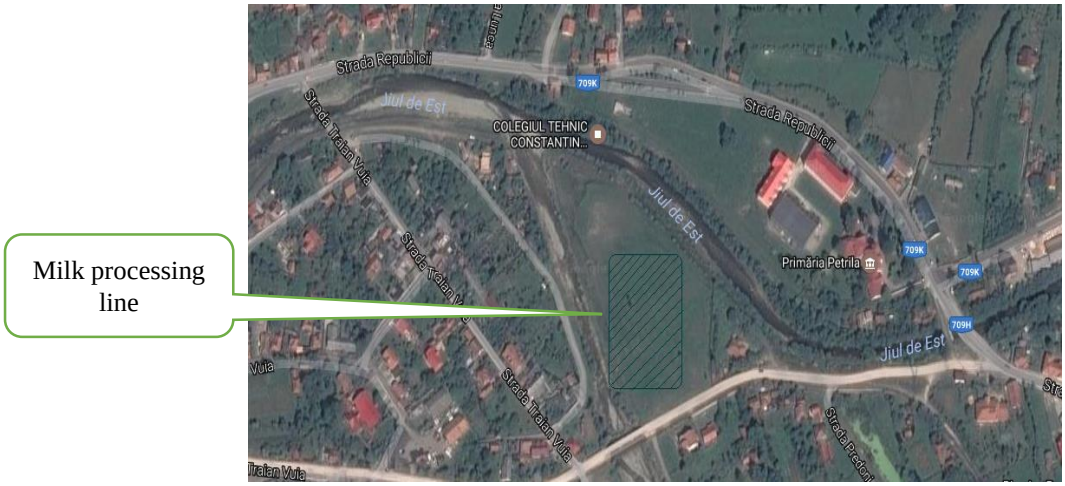

Fig. 17. Milk processing line

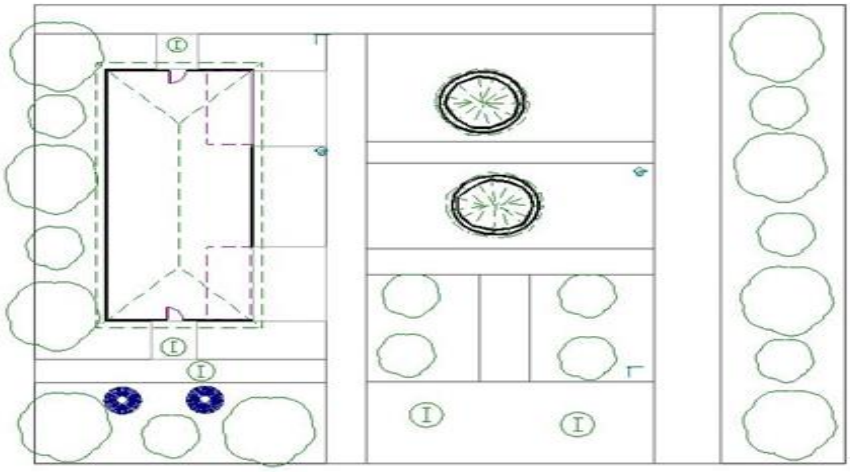

Fig. 18. Milk processing line plan

Fig. 19. Milk processing line location

At the same time, in support of this proposal, it can be stated that the location chosen, for the establishment of the milk processing line, is at approximately equal distances from the towns in the east of Valea Jiului, an area where the largest herd of animals is registered, approx. 12,563 heads, compared to 8,723 heads recorded in the west of the Jiu Valley.
A potential business case for milk processing is shown in table 11.

Table 11. Business sheet for the Milk Processing Line [11]

No.	Chapter	Explanations
1	The field of business	Dairy products
2	CAEN code Type of main activity	1051 (0141) Milk collection, industrialization and sale of dairy products (cow and sheep milk production, raw).
3	Location	Petrila
4	The duration of the investment	9 months
5	Initial investment value	approx. 1,000,000 Euros
6	Description of initial investment	The current project aims to establish a milk processing line, the production of dairy products and the establishment of a livestock farm consisting of at least 200 cows that will provide an average of 3000 litres of milk daily
7	Product registration	- consulting several nutritionists; - obtaining the optimal recipe; - approval by the Ministry of Health.

8	Product description	- drinking milk; - acidic dairy products; - melted cheese; - consumption cream; - ice cream.
9	Hierarchy of activities in time, until the start of production	- finding space; - fitting out the hall, laboratories and offices; - purchase of equipment and machinery; - recruitment and personnel selection; - establishment of a firm; - commissioning.
10	Human resources estimation	-1 administrator; -1 accountant; -1 production engineer; -1 animal husbandry engineer; -1 biologist; -1 environmental engineer; -2 electricians; -2 locksmiths; -5 space caretakers; -35 workers
11	Description of competitors	Delaco Braşov, Covalact Sfântu Gheorghe, Danone, Parmalat, TED.
12	The impact on the environment	All regulations and legislative norms in force will be respected.
13	Anticipated risks/countermeasures	- the increasing cost of the raw material; - domestic competition
14	Business sustainability	In the short term, the employment of the labour force available on the labour market, market penetration with a small but effective number of products will be pursued; in the medium term, the aim will be to find new markets, develop an image and promote the products.
15	Permanent employees	50

4.4. Cardboard packaging line

Given that activities will be developed in Valea Jiului area whose finished product (milk and milk products, natural pharmaceutical products, souvenirs, etc.) require packaging, in different containers whose raw material is cardboard, it is considered necessary and opportune, the establishment and development of a cardboard packaging production line.

The commissioning of this packaging line is conditioned by the identification of a location capable of satisfying several requirements. According to the accessibility index, the calculations lead to a location in Aninoasa area (see table 7) in an area in the vicinity of the location of the medicinal plant processing line, which would be of maximum interest for the workforce of Valea Jiului, namely on the site of the former poultry farm (fig. 20 - 22) located within the radius of the town of Aninoasa, at an altitude of 560m, more precisely in the Iscroni area, with the geographical coordinates: $45^0$22'24" N latitude and $23^0$21'2" E longitude, in currently decommissioned, available at approx. half the distance between the towns of Văii Jiului, near DN 66A Petroșani – Uricani and DN 66 Petroșani – Tg. Jiu.

Fig. 20. Location of cardboard packaging line

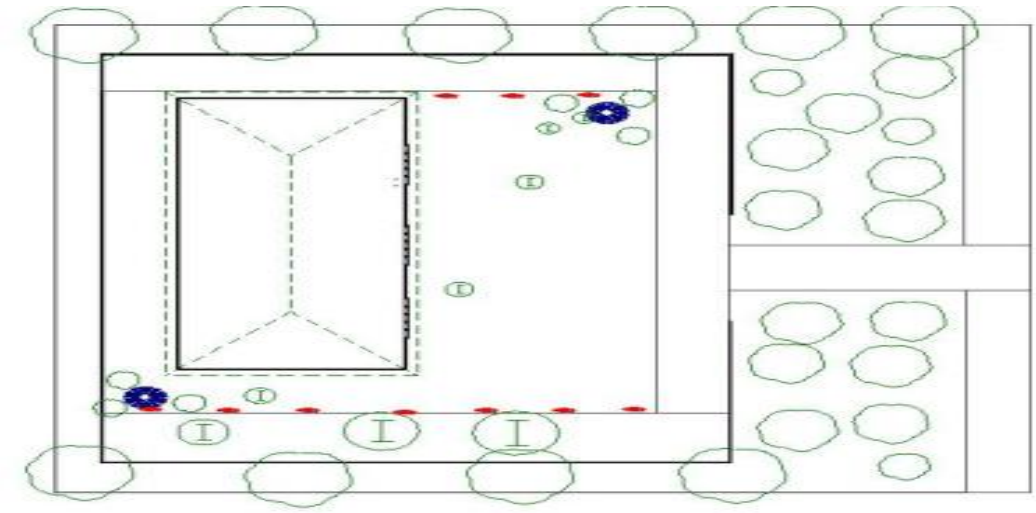

Fig. 21. Cardboard packaging line plan

Fig. 22. Cardboard packaging line location

A possible business sheet for such a line is shown in Table 12.

Table 12. Business sheet for *Production of cardboard packaging* [11]

No.	Chapter	Explanations
1	The field of business	Production of cardboard packaging
2	CAEN code Type of main activity	1721 Manufacture of paper and cardboard packaging
3	Location	Aninoasa
4	The duration of the investment	2 months
5	Initial investment value	approx. 350,000 Euros
6	Description of initial investment	The project aims to purchase high-performance equipment used in the printing and packaging sector. The main specific equipment purchased are: - machine for making cups and cardboard containers with ultrasonic welding, compressor, punches; -folding machine; - machine for the production of ecological cardboard trays; - EMA UV ovens; - computers + laptop
7	Product description	-packaging made of duplex cardboard and corrugated cardboard; - classic boxes intended for packaging a wide range of products (food products, non-alcoholic beverages, construction materials); -stamped boxes, intended for packing small household items, drinks, food products of various types, fruits and vegetables; - cased boxes

8	Hierarchy of activities in time, until the start of production	- finding/renting space; - furnishing the hall and offices for the administrative staff; - purchase of equipment and machines; - recruitment and personnel selection; - installation of equipment and carrying out tests; -commissioning
9	Human resources estimation	-1 administrator; -2 mechanical locksmiths; -1 accountant; -8 qualified workers; -1 production engineer; -25 unskilled workers; -2 electricians; -5 space caretakers
10	Description of competitors	Fares S.A.; GUTENBERG S.A.
11	The impact on the environment	All regulations and legislative norms in force will be respected
12	Anticipated risks/countermeasures	- personnel risk - reduced through a very careful selection of personnel and through a personnel policy oriented towards results and motivation; - risk of seasonality - reduced by customer loyalty with cyclical needs
13	Business sustainability	In the short term, the company aims to satisfy the needs of the newly established production lines in the area of Valea Jiului, and in the medium and long term, it will expand to the level of services provided, increase the quality of the products, as well as fitting in the expected costs and collecting their value
14	Permanent employees	45

4.5. The ecological and social impact generated by the implementation of the proposed projects

Both during the start of the works to implement the proposed activities, and after putting them into operation, it is considered that the most affected environmental factor will be the soil, soil which, through its properties, can supply plants with water and nutrients it is able not only to maintain plant life but also to ensure a certain production.

The opportunity to put into practice the activities presented above can be noticed by the following indicators:

- highlighting the loading of soils with certain pollutants;
- the decrease in soil fertility, observed through the quantitative and/or qualitative reduction of plant production caused by human intervention and the animal overpopulation of the mountain environment.

In order to highlight, in due time, the opportunity to start activities of this kind, it is necessary to create an appropriate soil quality monitoring system.

Based on this monitoring system, periodic observations will be made and, if necessary, interventions will be made in order to eliminate/minimize the negative effects of various factors on the soil.

The forms of soil degradation that could occur due to the proposed activities are: destructuralization; compaction; raising; acidification; decreasing fertility.

In order to prevent and combat soil pollution, both pollution prevention works and field and laboratory studies can be carried out within investment projects.

It can also be said here that due to the insufficient knowledge of possible pollution situations, of the land, an evaluation of the surfaces subject to the risk cannot be made, nor can the necessary works for its removal be carried out.

From a social point of view, we can say that the impact will be positive due to the newly created economic activities, the jobs generated by them and the awareness of the population in the area that the restructuring of mining does not mean a reduction in the standard of living and implicitly the birth of the process of migration of the population from the area, but on the contrary, a reorientation towards new activities, friendly to the environment, professional reconversion and highlighting that at the level of local authorities, and not only, there is a strategy for the development of the area, in the short, medium and long term, strategy whose fate depends on the future of Jiu Valley.

So to begin with, within the proposed activities, in addition to a variable number of seasonal workers, it is estimated that approx. 360 people to occupy positions for an indefinite period, following that after their development the number of employees and implicitly the activities carried out will also increase.

The jobs referred to include (fig.23):

- *the pharmaceutical industry* - activity implemented through a unit for the collection and processing of medicinal plants and forest fruits (mint, chamomile, rose hip, St. John's wort, sea buckthorn etc.) as well as the production of natural pharmaceutical products, located in the town of Aninoasa, an activity that would absorb

from the labour market approximately 75 employees for an indefinite period as well as approx. 150-200 seasonal. The basic activity will be supported by the cultivation, on the tailings, of the sea buckthorn, an activity that will still absorb approx. 150 people;

- *tourism activity*: - rural tourism

As part of this activity, in addition to the current guesthouses, small settlements can be built, which imitate in detail the characteristics of the Momârlan village, such as the customs and lifestyle of the Momârlan residents. These settlements, arranged in the geographical areas of Valea Jiului where traditions and the popular port are in a place of great honour, respectively Câmpul lui Neag, can be served by approx. 40 people. In addition to these, the rural population, adjacent to these settlements or in the middle of which these locations are located, can actively contribute to the promotion of the area, its customs and traditions, which will ultimately result in an increase in the standard of living of the local community such as and raising service standards;

- *local milk collection and processing* - due to the fact that the basic occupation of the inhabitants of the rural area of Valea Jiului, the Momârlani, is raising animals, the establishment of a milk collection and processing centre as well as a line of milk products will generate approx. 50 jobs and will also encourage animal breeders to increase their milk production and try different ways of association in order to access funds for development;
- *making cardboard packaging*: in this activity, it is estimated that approx. 45 people, and this activity is necessary to satisfy the packaging requests of economic agents in Valea Jiului;
- *seasonal activities*: within these activities, namely the collection of medicinal plants, the collection of forest fruits as well as other activities related to those with a permanent regime, seasonal jobs would be generated occupied by people not employed in the field of work or who want to round off incomes, thus eliminating *black work*.

Although, at first glance, the labour force absorption rate seems low, 12.41%, with the development of these activities, the number of available jobs will increase and at the same time the requested specializations, leading, in this way, to a competition both on the labour market, educational institutions/qualification centres, as well as between economic agents.

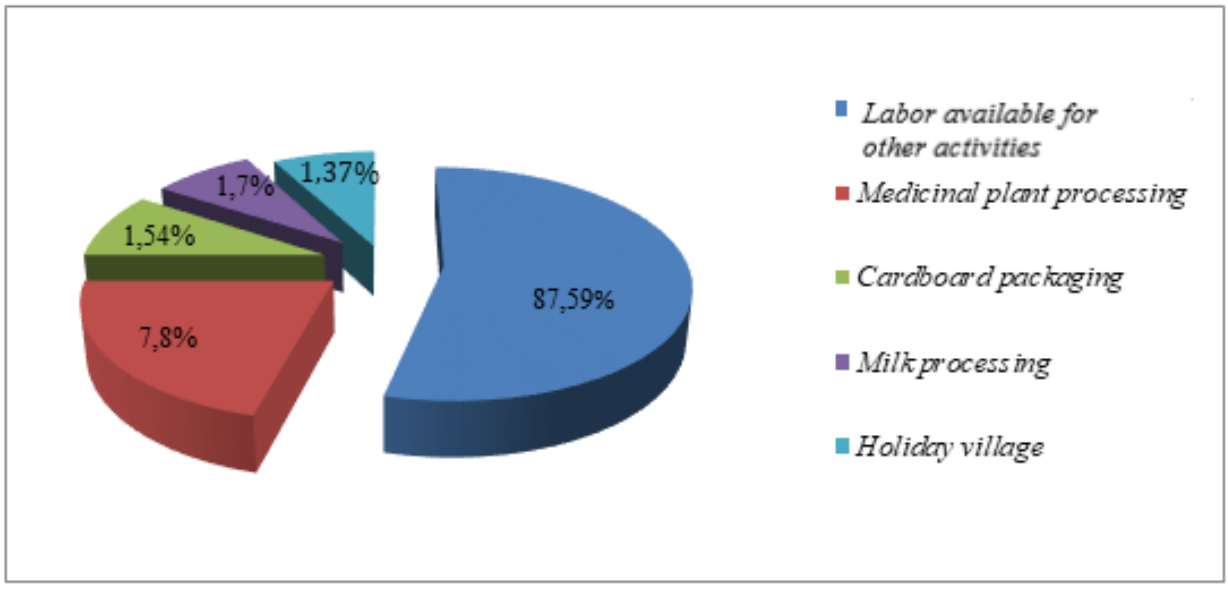

Fig. 23. Graph of the workforce absorption of the proposed activities

5. Conclusions

The implementation in Valea Jiului economy of today's European political energy vision, a vision that assumes a continuous increase in the production of electricity from nuclear energy and from renewable energy sources, and which corresponds to the concept of sustainable development, has produced an accelerated deindustrialization, with devastating effects among the local population.

Thus, at the end of the '90s, Valea Jiului was baptized the "Valley of Tears", and according to A.J.O.F.M. Hunedoara, the unemployment rate in Valea Jiului, at the level of 2000, was 25%, two and a half times higher than the national average, and compared to the population, at the level of 2022, out of a total of 113,439 inhabitants (cf. Census 2021) only 30,063 are engaged in various activities in the economy of the Jiu Valley.

In order to counteract this situation, it is necessary to apply a strategy for the development of the region, a strategy that should be the cumulative result of the efforts of all decision-makers at the local, county and national level, the general objective being the transformation of Valea Jiului area into a favourable area economic development, by eliminating the region's dependence on the mining industry.

In this context, human potential must be created and perfected, based on investments in people, respectively in the field of education, education and culture, professional training and health. This potential, governed by the spirit of the concept of human development, represents a lever in the creation of new existing jobs, the revision of the concept of work and its duration; at the same time, a new approach to the human-environment-economic triad is needed, an approach that mediates finding a balance between the existing natural capacities and the needs of society.

At the level of local public administrations, related to Valea Jiului, there is an awareness of the need to ensure a sustainable development of the settlements governed by them; but the complexity of this concept requires a set of complementary approaches and corresponding strategies that come in contradiction with the economic-social visions of the parties on the political colour palette of Valea Jiului.

In order to resolve these differences, it is recommended to establish an initiative body with the following objectives:

- ❖ involvement of all concerned parties (administration, NGO, population);
- ❖ training of specialized personnel;
- ❖ establishment of a data bank for Valea Jiului;
- ❖ establishing solid links between research and practice;
- ❖ implementation of projects and follow-up of their development;

all this leading to finding viable business solutions for the economy and the environment of Valea Jiului, businesses that put man and the environment in a relationship of mutual benefit, so that in the future they develop according to the possibilities and resources of their own ecosystems.

We believe that through what is presented in this article, we have brought detailed arguments to support these proposals in order to establish viable and sustainable solutions for a sustainable development of the communities in Valea Jiului.

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