



RIVERLINKS

INTRODUCTION

This study is one of the fruits of the project Riverlinks, framed in the common initiative Leader +, inside the actions of transnational cooperation, and developed by INTEGRAL, SOCIETY FOR THE RURAL DEVELOPMENT, in the northwest of the Region of Murcia (Spain) and VARSIN HYVÄ RY/LOUNAIS-SUOMEN KALASTUSALUE, in Turku (Finland).

In the Region of Murcia, the zone of action includes the high section of the Segura River, in the terms of Moratalla and Calasparra. In Turku, the study has been focused in the River Aura, in the southwest of Finland.

The general objective of the project is to increase the knowledge of the cultural and natural values of the river, and the so much interest of the local population as of possible visitors, through an increase in the offering of respectful activities with the principles of the sustainable development.

The work that expose subsequently collects the results of the project in the Region of Murcia, in relation to the analysis and appraisal of the cultural and natural resources. In the first place the socioeconomic, biological, and physical middle is characterized. Subsequently it is described and valued the cultural and natural patrimony. Finally they are presented the proposals of management, promotion and diffusion of the most significant values of the zone of action.

CHARACTERIZATION OF THE NATURAL MIDDLE.

I.1. PHYSICAL MIDDLE.

I.1.1. GEOGRAPHICAL SITUATION.

The High Section of the Segura river, object of the project Riverlinks, is situated in the Northwest of the Region of Murcia, inside the municipal terms of Moratalla and Calasparra.

Through good roads, the zone is connected with the highway Madrid-Murcia and the highway of the Northwest. Neighborhood roads, paved and in good condition, communicate the main fertile plain and lands of cultivations.

I.1.2. GEOLOGY AND GEOMORPHOLOGY.

The High Section of the Segura river is found in the geological control of the Beticas mountain range, more concretely in the zone Prebetica, inside the paleogeografic controls external and internal.

Since the geomorfologic point of view, the zone of study possesses an eventful relief with elevations separated by zones depressed by the ones that reflect the river valleys. The Segura valley is the morfogenetic unit more important than determines the shaped of the relief of all the zone.

I.1.3. SOILS.

The type of soil that characterizes the almost totality of the valley of the Segura River are Fluvisoles. It is a matter of alluvial floors formed from deposits and coluviales recent, without development of horizons except a horizon "Aocrico". Next to the Fluvisoles, other two types of floors appear, of smaller extension, like the Litosoles and Regosoles.

I.1.4. CLIMATOLOGY.

The climate is of semiarid type, with temperate winters and very warm and dry summers. The annual average temperature of the zone is situated around the 16° C. The average of the maximums is situated around 24° C, while the average of the lows is about 13° C. The period where there is risk of frosts goes from November to April, being registered an annual average of some 46 days in which the thermometer can descend under 0° C.

The rains present a great irregularity and certain torrential character. The summers are extremely dry. The average haste oscillates between 300 and 400 mm. The average during the day of haste is of some 25 al year.

I.1.5. SUPERFICIAL HYDROLOGY.

The study object zone is crossed by the Segura river that is born in Pontones (Jaén), to an altitude of 1413 m. Has a length of 341 km, with a relatively high slope. In its travel through our territory, receives the water of the rivers Benamor and Argos, before flowing with the river Quipar. These affluent are more than rivers, water avenues, that barely carry water during all the year. Their contribution more important are, of general form, water avenues that do not have a permanent volume and that possess a character torrential.



I.1.6. SUBTERRANEAN HYDROLOGY.

Our zone is found inside the control hydrogeologic Prebetico, being the most noticeable aquifer the Sinclinal of Calasparra, that supplies with its water contribution the great majority of the demand. It is an area of 113 km² of permeable surface, that presents contribute of 10 Hm³/year by rains and river bed.

I.2. BIOLOGICAL MEANS.

I.2.1. FLORA AND VEGETATION.

The territory that occupies us is found, since the point of view biogeographic, among the Spanish provinces Maestrazgo-of la Mancha and of Murcia-Almeriense, in the flat mesomediterraneo hot. Subsequently we expose the most representative communities of the vegetable landscape of the zone of study.

I.2.1.1. Vegetation of bank.

In the bank of the Segura river and in their affluents, is develop arboreal formations of caducifolios that contrast enormously with the dry landscape that encircles its fertile plain. The vegetation configures themselves in parallel bands that continue the course of the river. Their disposition is related, mainly, with the different sensibility and resistance of the species to the continuance of the water among its roots.

Currently it is very difficult to distinguish the different bands due to the deforestation of the banks and of the alluvial plains for the agricultural and grazing use, for being very productive and of easy exploitation. Besides, the exploitation as recreational areas and the channeling of the rivers and water avenues are some of the recent actions that are contributing to the degradation of these interesting ecosystems.

The degradation of the forests of bank leads to “zarzales” (*Rubus ulmifolius*) with diverse species of roses and climbing plants as honeysuckle (*Lonicera biflora*), herbs of the pilgrim (*Clematis vitalba*), etc.

The river’s pools and streams, on floors flooded, are colonized by reedbeds.

I.2.1.3. Vegetation of avenues.

In the river avenues, with courses of sporadic water, most of caducifolios are substituted for plants with adaptations to the drought and to the high temperatures, like the tarayales and the adelfares.

I.2.1.4. Vegetation of the rice fields.

The cultivations of rice have represented and represent the suitable environment for the establishment and dispersion of numerous species

graminoides, many of them of exotic origin, like the mijera (*Echinochloa oryzicola*), the punzon (*Cyperus*) and the espailla (*Scirpus mucronatus*). These plants constitute one of the main problems in the cultivation of the rice, since they have passed to be habitual weeds in the rice fields.

I.2.1.5. Pine forests of pine carrasco (*Pinus halepensis*)

The pine forests of pine carrasco form extensive forest masses, often clarified and with a undergrowth comprising by bushes heliofilos and termofilos, like juniper (*Juniperus oxycedrus*), kermes oak (*Quercus coccifera*), lentisco (*Pistacia lentiscos*) or blackthorn (*Rhamnus lycioides*).

I.2.1.6. Thickets.

The thickets are vegetable communities constituted by bushy species and subbushy, of low and average size. They present a great complexity and a high biodiversity. Often associates to the pine forests are found, or can occupy zones without woodland. They are represented basically by arnachales, chaparrals, sabinares and esparto fields.

I.2.1.7. Fields of thyme.

In the zones of little floor or excessively shepherded, the thickets are substituted for open thickets of small size. They emphasize the fields of thyme basofilos of *Thymus antoninae*, an endemic exclusive of Murcia-northern.

I.2.1.8. Vegetation of salt pits.

The salty floors are colonized by beds of reeds, almarjales and communities of everlasting flowers. They are poor communities in species, constituted by plants of small size that, in general, leave good part of the floor discovered. Their disposition depends on the continuance of the water in the superficial layer and of the degree of salinity.

I.2.1.9. Vegetation rupicola (*Asplenietea trichomanis*)

The plants of rupicola environments grow of broken way in cracks and concavities. In our territory there is a great diversity of communities that are rich in exclusive endemic of the southeast of Spain and of Andalusian zones. In small landings earthy appear ferns like *Cheilanthes acrosticha* and *Cosentinia vellea*.

I.2.2. WILDLIFE.

The presence of different ecosystems in our territory permits the apparition of a rich wildlife diversity, many of which are included in different categories of threat according to the Law 7/95, of 21 of April, of the wildlife, hunt and river fishing. Subsequently we present the most characteristic species, for each one of the environments or habitats more representative.

I.2.2.1. River environments and humid zones.

The birds are the better wildlife component represented in the banks of the rivers. The most characteristic species are: aquatic blackbird (*Cinclus cinclus*); kingfisher (*Alcedo atthis*); washerwoman cascadeña (*Motacilla cinerea*) and chick of water (*Gallinula chloropus*).

Among the associated mammals to the medium aquatic emphasizes the otter (*Lutra lutra*), the polecat (*Weasel putorius*), the shrew (*Crocidura rusela*) and the rat of water (*Arvicola amphibius*). Reptiles of interest are the snakes of water (*Natrix maura* and *N. natrix*) and the leprous turtle (*Mauremys caspica*). They are frequent, also, amphibious as the common toad (*Comica comica*), the running toad (*Comica lodestone*) and the common frog (*Frog perezi*), that find in these habitats a suitable place to be reproduced and even to live on permanent form.

The species icticas indigenous present in the territory are: barbel (*Barbus sclateri*), bit (*Squalius pyrenaicus*), eel (*Anguilla anguilla*) and common trout (*Salmo trutta*). The remaining species are aloctonas (indigenous of the Iberian Peninsula) or exotic to the peninsular fauna.

In the reservoirs the wealth of the bird life is very various, emphasizing the populations of zampullín small (*Tachybaptus ruficollis*), real heron (*Ardea cinerea*) and large cormorant (*Phalacrocorax carbo*), sea bird that is being introduced in reservoirs and wetlands.

In the rice fields, indicate a small mollusk of Asian origin, the *Gyraulus chinensis*, introduced in the Iberian Peninsula through the cultivation of rice. It emphasizes, also; the American red crab (*Procambarus clarkii*) whose proliferation is one of the causes of regresión of the crab of indigenous river (*Austroprocambarus pallipes*), next to the general degradation of the river habitat.



I.2.2.2 Pine forests and thickets.

The own mammals of this biotope are various and of important presence. Among the large mammals can be observed, of occasional form, the mountain goat (*Capra pyrenaica hispanica*) and the muflon of the atlas or arrui (*Ammotragus lervia*). Emphasize, also, two of the most important cynegeticses species as the rabbit (*Oryctolagus cuniculus*) and the common hare (*Lepus granatensis*).

The birds are represented by a great diversity of small species, some own of this middle as the agateador common (*Certhia brachydactyla*) and the common owl (*Stix aluco*). One of the species more characteristics of the pine forests is the piquituerto (*Loxia curvirostra*).

Besides, all the species of diurnal rapacious birds present in the zone utilize the scrubland as hunting ground, where some of them find also their area of nest-building.

In the zones of dense thickets they take refuge some reptiles as the lizard colilarga (*Psammotromus algericus*), the snake of stair (*Elaphe scalaris*) and the southerner (*Coronella girondica*). In the sunny, low thickets and rocky environments, is found the viper hocicuda (*Vipera latasti*), of some 50 cm and dangerous bite.

I.2.2.3. Craggs.

The better wildlife group represented in this habitats are the birds. Among the numerous species of birds of prey we emphasize the punctual presence, as in the Cannon of the Almadenes, the golden eagle (*Aquila chrysaetos*), the wandering hawk (*Falco peregrinus*) and the real owl (*Bubo bubo*), the three are considered of special interest. Its walls also serve of refuge for populations of medium bat of horseshoe (*Rhinolophus mehelyi*) of importance to regional scale.

I.2.2.4. Cultivations and dry farmings.

The group of the birds is the most numerous one. The birds abound with hardly granivorous state, as are diverse species of fringilidos. Very connected with agricultural zones the common owl (*Tyto alba*) is presented .

In the cultivations of cereals is important the presence of the calendar (*Melanocorypha calandra*) and the terrera common (*Calandrella cinerea*).

In the arboreal cultivations of dry farmings emphasize, by the bright color of their plumage, the bee-eater (*Merops apiaster*) and the rattle or tile (*Coracias garrulus*). Both species utilize the existing terraces in the cultivations and the margins of the water avenues to build their nest a strait and long tunnel.

The gardens and irrigations are colonized by the common sparrow (*Passer domesticus*), that comes to constitute authentic plagues producing serious damages to the cultivations. Some typical species of forest formations have adapted very well to this middle as the verdecillo (*Serinus serinus*), the common greenfinch (*Carduelis chloris*) and the curruca cabecinegra (*Sylvia melanocephala*).

I.2.2.5. Urban zones and remote houses.

The media antropizade (farmhouses, houses of work, cultivations, etc.) are colonized by small mammals as the common rat (*Rattus norvegicus*), the homemade mouse (*Mus musculus*), as well as by the hedgehog (*Erinaceus europeus*), the little shrew (*Suncus etruscus*), the weasel (*Weasel nivalis*) and the topillo common (*Pitymys duodecimcostatus*). The caves, rocky holes and farmhouses abandoned are inhabited by numerous bats (*Rhinolophus ferrumequinum*, *R. mehelyi*, *Myotis myotis*).

Associates to farmhouses and rural nuclei we find swallows (*Hirundo rustica*, *H. daurica*), airplanos (*Delichon urbica*), sparrows (*Passer*) and, in winter, black starlings (*Sturnus unicolor*) and pintos (*Sturnus vulgaris*). The hunting birds are basically represented by the red partridge (*Alectoris rufa*), the bobwhite (*Coturnix coturnix*), the ringdove (*Columba palumbus*) and the common lovebird (*Streptopelia turtur*).

The most typical reptiles of places inhabited are the salamanquesas (*Tarentola mauritanica*, *Hemidactylus turcicus*) very known by hunting next to the light; they can climb for the most unsuspected places due to some fine cushions in their legs. The snake of horseshoe (*Coluber hippocrepis*) often itself about to settlements and highways, where used to be knocked down.

I.3. LANDSCAPE

Our zone of study offers very diverse landscapes produced by the action of the man on the middle and the morphology characterized by the step of the Segura River and its affluent through the mountainous reliefs. The landscape is articulated in three large units, the gardens, the fields and the mountains.

The Segura riverbed, when leave the Reservoir of the Cenajo, crosses a series of mountainous lands, being produced a sequence of meanders that conform very characteristic valleys. Their fertile plain are zones of traditional cultivations, some of them thousand-year-old. It emphasizes the rice enclosure of Calasparra, represented by the paddies of Salmerón and Calasparra, that occupy large extensions and contribute to the landscape an unique singularity in the region. Other determinant cultivations of the landscape of fertile plain are the orchards and the new irrigations, situated in the surrounding area of the paddies.

The fields, constituted by flat or wavy lands, harbor the cultivations of dry farmings. It emphasizes the Plains of the Captain cultivated of cereal. The population is grouped in small farm houses and remote work houses.

The mountain range form the sides of the basins of the rivers Segura, Benamor, Argus and Quipar, with altitudes between 607 m y 1.479 m. They harbor the masses of pine forests, thickets, esparto fields and typical pasturelands of the zone. They are spaces scarcely populated, with most of human settlements abandoned by the emigration of the last decades.

Other singular elements are the landscapes that give place the reservoirs of the Cenajo and of Alfonso XIII. These large volumes of water permit the establishment of an abundant vegetation and a singular morphology.



I.4. NATURAL VALUES.

I.4.1. AREAS PROTECTED OR UNDER PROTECTION OF EUROPEAN ENVIRONMENT. THE NETWORK NATURE 2000

I.4.1.1. Mountain range and High fertile plain of the Segura and river Benamor.

Place of Common Importance (PCI) established, that understands the river banks of the high section of the Segura river and those of its affluent Benamor and Alhárabe, as well as the assembly of mountain range of its environment. It emphasizes the vegetation of bank and the vegetation of gypsum that surfaces in Salmerón and the Cerro of the Lomas.

I.4.1.2. River Quipar

The river Quipar has been classified as Place of Common Importance (PCI), in which emphasizes the vegetation of bank dominated by tarays (*Tamarix sp. pl.*), beds of reeds and cane plantations. Besides, the aquatic fauna that inhabits and rests in this space during the migratory steps confers an important value to the zone.

I.4.1.3. Mountain range of the Mill, Reservoir of the Quipar and Plains of the Cagitán.

Area appointed as Zone of Special Protection for the Birds (ZSPB), based on the presence of real owl (*Bubo bubo*), wandering hawk (*Falco peregrinus*), little stork (*Himantopus himantopus*), alcavaran (*Burhinus oedicephalus*) and redpeak crow (*Pyrrhocorax pyrrhocorax*).

I.4.2. AREAS PROTECTED OR UNDER PROTECTION OF REGIONAL ENVIRONMENT.

I.4.2.1. Forest of Bank of Cañaverosa.

Natural space protected declared under the figure of nature Preserve. It is situated in the river bed, banks and margins of the Segura river, in a width of 100 meters. Its forest gallery is one of the vegetable communities bank better conserved of the Region of Murcia.

In this river runner a rich fauna is sheltered with some of the rarest species and threatened of the Region, emphasize the otter (*Lutra lutra*), the leprous turtle (*Mauremys leprosa*) and the odonate (*Coenagrion mercuriale*).



I.4.2.2. Cannon of The Almadenes.

The Cannon of The Almadenes is located in the high course of the Segura river, between Calasparra and Cieza. Has a length of nine kilometers in the Segura river and two kilometers in the river Quípar. Its surface circumscribed to the river bank is of 116 hectares. It was declared space protected, justified by its high interest geomorfologic (walls of more than 150 m of depth in some points, excavated by the Segura river in an environment characterized by the shaped karstic), hydrologic, archaeological, landscape, as well as by the singularity and integrity of the ecosystems of bank.

I.4.2.3. Areas of protection for the zones of nest-building of the eagle-goshawk partridge.

It is a matter of an area of protection for the fauna that includes, not a continuous area, but numerous dispersed points in the places of young nestling rapacious birds. They are found above all in the mountains range and high fertile plain of the Segura river, in the environment of the reservoir of the Cenajo and in the neighborhood of the river in their course toward Salmerón.

I.4.3. OTHER AREAS OF INTEREST

I.4.3.1. Places of Geological Interest.

The diversity of substrata and forms of the shaped next to the tectonic complexity of the zone is translated in a rich geological patrimony of notable landscape, scientific, and cultural value. Inside this patrimony can be emphasized concrete tectonic elements that constitute easily appreciable singularities in the landscape, associates often to spots of great beauty. They emphasize among them:

Sinclinal of Calasparra.

Cave of the Port.

Shaped of the Sanctuary of the Virgin of the Hope.

Hill of the Salmerón.

Cave of the Serreta.

Mining district of Cehegín.

I.4.3.2. Microreserves of flora

The microreserves of flora are Places of Botanical Interest, based on the protection of a territory of small size and high botanical interest, destined to the monitoring and long-term conservation of the vegetable species or types of rare, endemic vegetation or threatened. In the high section of the Segura river three have been proposed.

I.4.3.3. Wetlands.

The wetlands are ecosystems of great value due to that provide of important resources to the animals, like water and mineral salts, and contribute to the diversification of the landscape. Besides, they intervene in the functions of climatic and hydrologic regulation, as well as in the control of processes of erosive and sedimentation. The wetlands contribute, also, to the economic development (paddies, aquaculture, irrigations) and are bearers of important esthetic, social and even religious values that contribute cultural and emotional wealth to the people. In dry zones or subarid as the Region of Murcia the wetlands, by their shortage, have a special importance.

II. SOCIOECONOMIC CHARACTERIZATION

II.1. POPULATION AND EMPLOYMENT.

The High Section of the High fertile plain of the Segura river, crosses the municipalities of Moratalla and Calasparra, with a population of approximate 8.549 and 9.674 inhabitants, respectively. Calasparra possesses an extension of 18.540 hectares and a density of population of 52 hab/km². The extension of Moratalla is of 95.419 hectares, with a density of very low population, of 9 hab/km². In both cases the density of population is quite lower to the average of the Region of Murcia (114 hab/km²).

Is a matter of a population aged, mainly male, consequence of the historic process of rural exodus to urban zones and of the descent of the birthrate, due to that were the women, the ones that more emigrated. This process of emigration is produced of considerable form from 1950. The demographic evolution of the two municipalities is narrowly related to the importance of the agrarian sector and to the scarce development of the industrial sector.

Nowadays, from among the economic sectors, the services is the one that greater employment provides to the municipalities of Calasparra and Moratalla, as occurs in the remainder of Spain, included the Region of Murcia. It is to emphasize, also, the great weight of the agriculture among the working population.

II.2. ECONOMIC ACTIVITIES

II.2.1. AGRARIAN ACTIVITIES

The Region of the Northwest is a territory where the forest activity exceed clearly in comparison with the remainder of regions of the Region of Murcia. The agriculture, with a similar surface to the forest one (39%) in the Region of the Northwest, is situated under the regional agricultural surface (53.5%).

II.2.1.1. Agriculture

Calasparra possesses a surface of 6.432 Has. destined to cultivations, of which a 50% are of irrigation. In Moratalla, with a total surface of cultivations of 28.788 Has, dominate the cultivations of dry farming (89,7%).

Among the cultivations of irrigation, above all of them emphasize the paddies of Calasparra and Salmerón with denomination of origin. Besides, fruit trees are

cultivated (apricot and peach trees) and vegetables of garden, next to extensive extensions of corn, wheat or barley. A cultivation that at present is in boom, and that can conduct to new transformations of the traditional cultivations, is the flower growing in greenhouses.

As for cultivations of dry farming dominate the cereals (wheat, oat and rye) and the ligneous cultivations. Among the ligneous species emphasize the almond tree, with multitude of varieties, the vine and the olive.

II.2.1.2. Cattle raising.

The main activity cattle raiser is of character semiextensive. It is centered in the grazing of goats and sheep of indigenous races. It is a matter of a traditional activity that, along the history, has been perfectly integrated with the uses of the floor, so much agrarian as forest, obtaining for the cattle remainders of crops and pastures as food and producing organic fertilizer for the cultivations.

A cattle raiser exists also of clearly industrial cut, of great economic importance, represented mainly by hogs, birds, bovine, horses and mobile hives. In many cases, these exploitations cattle raisers generate problems of residual water and other scraps that affects to the quality of the water, produce smells, etc. To emphasize the decreasing presence of mules, donkeys, as well as the disappearance of the rustic cow from the Segura of great aid in the past to the rice farmer.

II.2.1.3. Forest activity

The mounts situated in around to the high section of the Segura River are to a large extent of public ownership.

Among the arboreal formations dominate the pine forests of pine carrasco, generally exploited for wood of low quality (conglomerate, paste, etc.). The parks and poplar of the groves and banks are vegetable formations also with a forest use.

II.2.1.4. Hunting and fishing activities

The hunt and the river fishing suppose important resources for the rural socioeconomic development and forest of the zone. The hunting activity is centered mainly in the small game hunting and in private reserves.



As for the fishing, there are 11 fishing species of the ones two (trout and barbel) are indigenous. Other frequent species are the little carp, fad, black-bass and gambusia. Intensive enclosures of fishing in the Segura River exist, in the section of Calasparra and Moratalla and enclosures free in the reservoir of the Argus and reservoir of the Quipar.

II.2.2. INDUSTRIAL ACTIVITY.

II.2.2.1. Manufacturing industries

The industrial activity has little weight in the assembly of economic activities of the region.

The industries destined to the production of beverages and food are the ones that occupy a more notable position, with the highest number of companies that give work to more population.

The industry of the wood has an a lot greater importance in Moratalla that in Calasparra, as a result of the great extension of forest of the municipality, fundamentally pine, although is being relegated by the poplar. The activity is centered in the wood containers production and, in smaller measure, the production of furniture.



II.2.2.2. Power stations

Centering us more in the environment of the river the industrial activity that more influences in it is the production of electric power.

Power stations	Dam of the "Cañaverosa Cenajo"	Cañaverosa	La Esperanza	Almadenes
Power	15 Mw.	4.440 Kw.	1.100 Kw.	14.400 Kw.

II.2.3. TOURIST ACTIVITIES

The rural tourism has experienced a strong boom in the last decade and is one of the sectors with more future of our Region.

The natural patrimony of excellent value, next to the innumerable cultural and historic elements, offers to the region a suitable potential for the development of a sustainable alternative tourism, far away of the coastal planning .

In the High Section of the Segura River a strong activity exists already, with presence of several infrastructures of public use (shelters, recreational areas, rural houses, center of interpretation, etc.). Diverse activities of nature are practiced and adventure related to the aquatic middle and the spelunking. The rural tourism is beginning to develop around a small hotel situated in the rice Enclosure. The religious tourism, related to the Sanctuary of Our Lady of the Hope offers an offering that attracts to a great number of visitors.

An extensive offering exists also to carry out activities of hiking, with routes of geological, biological, landscape interest.

III. CULTURAL VALUES

1. INTRODUCTION. HISTORY

The Segura river and its affluent has been the element on which has rotated the development of the Region of Murcia along the History. Since the Prehistory, their strategic geographical situation and the extensive existing fertile plain have enabled the settlement of diverse civilizations, that have left a deep and indelible track and a rich patrimony cultural associate.

The Romans were the first in doing productive the so-called "dry lands" by means of the construction of silos, subterranean wells that permitted to take advantage of the water of the subsoil.



Of the Middle Ages we should emphasize the Moslem constructions for the use of the water as are the aljibes, the ferris wheels, channels, ditches, rafts, wells and other important works for the agrarian development of the zone, as well as rural dwellings, hermitages and medieval fortresses.

During the Modern Age the main plantations for the subsistence were vegetables, fruits, wheat and barley; for the export was cultivated silk and barrill. During the 18th centuries and XIX new cultivations are introduced like the rice and the potatoes. In the areas of dry farming there is a strong expansion of the olive, the fig tree and the carob tree.

Along the 20th century continues the intensification and specialization of the agriculture. The traditional elevators hydraulics structures (ferris wheels and gird) are substituted for fire engines and electric motors. For the regulation of the Segura river, to assure the irrigations of summer and to increase the production of electric power, a new reservoirs construction plan is sets in motion (Quipar 1917, Cenejo and Fuensanta 1960). The entrance in operation of the Tajo-Segura transfer and the exploitation of the groundwater favors an increase considerable of new irrigations.

III. 2. PLACES OF ARCHAEOLOGICAL INTEREST

III. 2.1. MOSLEM SITE OF OLD VILLAGE

The Old Village is a farmstead inhabited in the Islamic epoch, between the 11th centuries and XII. It was based on a ridge of low altitude (297,97 m), in the right margin of the Segura river, safe from the floods of the Segura and since where a valley crossed by three of its affluent was dominated: Benamor, Argus and Quipar. Its inhabitants should be dedicated basically to the agriculture, since they had extensive orchards with abundant water coming from the river.

III. 2.2. CAVE PAINTINGS OF THE "ABRIGOS DEL POZO" (SHELTERS OF THE WELL).

The rock assembly of the shelters of the Well is found in a network of caverns and shelters of espeleo-archaeological interest, situated in the mountain range of the Molino "Mill" (Calasparra). It understands two continuous shelters that contain cave paintings of the eneolítico, with an antiquity of more than 4000 years. They belong to the Schematic Rock Art.



III. 2.3. CAVE PAINTINGS OF THE CAVE OF THE SERRETA

They are located in the walls of the Cannon of the Almadenes, in the left margin of the Segura river, in the municipal term of Cieza. On the whole there are 50 representations of human figures, quadrupeds and archers pursuing to horse, distributed in two boards, that belong al Schematic Rock Art.

So much these paintings as those of the Shelters of the Well have been object of a particular processing in the law of the Spanish Historic Patrimony that declares them Wells of Cultural Interest. Besides, both paintings were declared World Heritage by the UNESCO, in 1999.

III. 2.4. ARCHES OF THE WATERCOURSE

Remains of an old Roman aqueduct redone almost totally at the beginning of the fifteenth century. It is situated to 3 km al southeastern of Calasparra to 100 m to the right of the road of Calasparra to Mule.

III. 3. PLACES OF RELIGIOUS AND ARCHITECTURAL INTEREST

III. 3.1. SANCTUARY OF HOPE

The Sanctuary, with more than four centuries of antiquity is found nailed in a rocky shelter to the riversides of the Segura river, 6 kilometers of the urban helmet of Calasparra. It is among the Mary's places more visited of Spain and the first one of the Region of Murcia.

III. 4. PLACES OF AGROECOLOGIC INTEREST

The Places of Agroecologic Interest are areas of traditional cultivations, that present a great diversity of genetic resources, that have contributed of form more or less significant to the socioeconomic development of their environment, and that conserve prominent cultural elements linked to the history and al landscape. These agroecosystems have marked the identity of the towns and therefore should be maintained in its entirety, not as remote elements.

III.4.1. THE RICE ENCLOSURE OF CALASPARRA AND SALMERÓN

The *rice Enclosure Calasparra and Salmerón* is nailed in a very mountainous area and fraction of the High fertile plain of the Segura. Its origin is mended, to the Arabian epoch. The paddies are located in small fertile plain, enlargement and narrow stripes delimited by the river and the ditches mothers. At present, occupies a total surface of 1.909,54 h., of the ones approximately 1.000 h. are dedicated at present to the rice cultivation.

The average altitude of the Enclosure is of some 450 meters above sea level. This fact, next to its situation in the interior of the region, confers it a clearly different ecological environment to other rice zones, as well as a greater quality, derived of the temperature of the zone and the purity of the water.

III.4.2. THE SALTMINE OF THE RAMONA

The Salt mine of the Ramona are situated close to the reservoir of the Quipar, in a steppe zone, drought, with a very traditional rural landscape and private. Their origins are mended, probably, to the 14th century and they have been exploited until very recent dates.

Besides their productive value, the interior saltmines as those of the Ramona, concentrate also important environmental values, including their habitat of singular species of fauna, landscape value and the cultural historic interest of their systems of exploitation and associated architecture.

The saltmines possess a potentiality of use based on the exploitation of their educational, recreational, therapeutic, and mineral resources.

III.4.3. THE REAL GLEN OF CALASPARRA OR CORD OF BROKEN (CORDEL DE ROTAS).

The Real Glen of Calasparra or Cord of Broken constituted an in transit important way between Castile and Murcia, above all in which refers to the ovine cattle. Its origin went back to the centuries V and VI. Its regulation was structured around the Mesta Castile. The main benefit of this extensive grazing was the wool, and to this followed the meat and the cheeses. It possesses great cultural and historic importance as the remainders of cattle water holes and resting places testify it, as well as other historic remainders that find along their traveled through.

III.5. ORAL AND ETHEREAL PATRIMONY

The Ethereal Cultural Patrimony is constituted by the practices, representations and expressions, the know-how and the techniques that secure to the communities, the groups and individuals a feeling of identity and continuity. This patrimony, transmitted of generation in generation, is recreated permanently by the communities and the groups in function of its middle, its interaction with the nature and its history.

In the framework of this concept we include the traditional works.



III.5.1. THE CULTIVATION OF THE RICE

The cultivation of the rice, in the rice Enclosure of Calasparra, continues being very similar to the employed during centuries. The special topography of these lands, with considerable unevennesses from ditch to the river and in stripes very straits of land, makes almost impossible its mechanization, so its cultivation is practically craft.

III.5.2. CULTIVATION OF CEREALS

The cultivation of the cereals has had an important weight in the whole agricultural activities and therefore in the regional economy.

III.5.3. THE CULTIVATION OF THE ESPARTO GRASS

The esparto is a grass that can reach the meter and a half of height. In natural conditions is frequent on deep little floors in sunny places, in all the mountain range that flank the high section of the Segura river, in the Region of the Northwest.

From epochs preromans until well entered the 20th century the esparto has been cultivated for constituting the commodity to manufacture from utensils for the home, to implements of farming or for the threshing and the work of the esparto has been one of the most important activities during great part of the 20th century. One of the main causes of the abandonment of the use of the esparto as commodity has been the difficulty that offers its harvesting and to that all the intents by inventing a profitable mechanical middle have failed. This next to the apparition of new materials as the plastic, the rubber, the synthetic fiber, etc, has done that this activity remain relegated to the work of a few artisans.

III.5.4. THE CERAMICS OF VALENTÍN

The ceramics of Valentín come from the period "argarico", some 3800 years ago. This is one of the oldest activities of the zone with the one that traditionally bricks, tiles and numerous objects of clay have been manufactured. As bequest of this thousand-year-old activity, nowadays the ovens to cook ceramics remain us so called "morunos", although they are of Roman origin.

III.5.5. CUT AND TRANSFER OF TRADITIONAL WOOD

In the Modern Age, part of the wood originating in the mountains of the Segura were sent, downstream, to Calasparra. The process began with the cut down of the trunks with the only tool of an axe. The cut wood was transferred with mules or cars to the riverside, itself "encambraban" and a raft of water with branches of pine and brush of "lentisco" was formed . To conduct the wood downstream was built a raft with four or five sticks tied, where one rowed and another threw of the pines with the hook.

This job that, by its special characteristics did not suffer any evolution with the step of the years, was despised in the middle of the 20th century.

IV. DIAGNOSIS ABOUT THE SITUATION OF THE HIGH SECTION OF THE SEGURA RIVER

IV.1 PROBLEMATIC RELATED TO THE NATURAL RESOURCES

The territory studied is one of the zones with greater natural values of the Region of Murcia. The presence of the Segura river and four of its affluent confers to this area some special characteristics, inside the general dry and semiarid world that characterizes the southeastern of the Iberian Peninsula.

One of the most important problems related to this space is connected with the *quality and availability of water resources*. The associated ecosystems to the water harbor a great biological diversity, for which its conservation should be priority and connected with a sustainable and rational use of the same one. The presence of numerous cultivations, traditional or industrialized, and the exploitations cattle raisers situated along the river river bed, is one of the main problems that affects to the quality of the water, due to their contribute of organic matter, nitrates, insecticides and pesticides. Besides, risk of accumulation exists of poured uncontrolled in the proximity of the riverbed, coming from the population centers or of the numerous visitors that accumulate in around the Virgin Sanctuary of the Hope.

Other problems related to the conservation of the river course and the humid zones, are the alterations produced by movements of lands, infrastructures and extractive exploitations. The human activity that has been carries out in this space has brought with itself actions of dredged, reservoir, drying, channeling, extraction of dry, etc. In spite of these factors can be affirmed that the quality of the water of the Segura river, in this section, is relatively good.

The *conservation of the vegetable resources* is another of the large environmental problems of the zone. A high risk of forest fires in all the mountains range of the zone exists, as a result of high vulnerability of the fire of our vegetable cover. A test of it is constituted by the great forest fire occurred in 1994 that eliminated great part of the forest mass. The elimination of this cover has generated processes of water erosion, next to the impact produced in the landscape and on the species of flora and rare fauna or threatened. Currently there is danger by overload cattle raiser in the zones of regeneration of the vegetation.

The problems of greater reach that affect to the *conservation of the fauna* are related to the fragmentation and alteration of the habitat. Between the significant and most common alterations that can affect to the fauna we can cite the transformation of the vegetable cover and of the traditional agrarian



landscape and the increase of the consumption of agrochemicals linked to the intensification of the exploitations.

One of the greater threats, related to the extinction of the diversity native of the basin of the Segura river, come from the acclimatation of exotic species. An especially serious case is that of the "gambusia", fish that come from North America that is found among one hundred most aggressive species of the planet by the type of plague that comes constitute, and has colonized practically the totality of aquatic habitats of the Region. Other species have been introduced in the Region with recreational and/or sports end, either for the Administration (carp, black-bass), or by individuals that traslocan species that come from other basins (lucio-perca, perch-sun, alburno).

Other problems related to the fauna are the poaching, the effect barrier of some infrastructures as the hunting and agrarian the fence, the laid out electric and the extractive activities.

The conservation of the landscape finds as main difficulty the danger of fires that threatens to the vegetable cover and the abandonment or substantial transformation of the traditional agrarian uses. One of the activities that generates greater landscape problems in the Region of the Northwest is the strip mining. Fortunately, this activity is presented of very punctual form in the High Section of the Segura river.

IV.2. PROBLEMATIC DERIVED OF THE ECONOMIC ACTIVITIES.

The problematic of the agriculture is due to the existence of fragmentation, lack of asociacionismo and abandonment of the agrarian activity to full time (for lack of profit value) fundamentally. The main deficiencies related to the irrigations are showed in the bad state of the infrastructures of irrigation, problems in the regular provision of the water, low mechanical and technical level, problems of commercialization in optimum conditions of profit value, scarce variety and rotation of cultivations in the ligneous cultivations. In the dry farming the situation is more problematic if possible, since the cultivations depend in great measure of the haste, very irregular, and of the common aids, increasingly more scarce by being cultivations of low economic profit value.

The cattle breeding, exploited in part in semi-extensive state, presents the advantage of an easy compatibility with the environmental values of the zone whenever the management be the adequate one to the surfaces pastables, above all in the areas of greater ecological interest. As for the intensive cattle breeding (pork and poultry) has experienced in recent years an important



increment what is generating problems of contamination in subterranean and superficial water.

The problematic socioeconomic related to the forest sector is related to the scarce profit value of the forestry, the abandonment of the traditional uses of the mount, the high incident and risk of forest fires and the poor management of the mounts.

In the tourist sector, of great projection in the zone, there is shortage of hotel beds and the boom of the rural tourism has not gone accompanied by a sufficient level of professionalization, what has supposed a reduction in the quality of the offering. A strong pressure exists in spots of high botanical and landscape value, as in the Cannon of the Almadenes.

Some of the problems related to the sustainability of the urban development activity is found in the sectorization as zone urbanizable of the places of interest agroecologic, not include in areas protected or under protection. The illegal constructions proliferation risk exists also. The network of roads presents enough deficiencies what complicates with general character the development of activities. The network of paths and forest trails requires an important improvement to avoid that the accessibility result a factor constraint at the moment to visit the different existing spots.

V. STRATEGIES OF MANAGEMENT OF THE CULTURAL AND NATURAL PATRIMONY OF THE HIGH SECTION OF THE SEGURA RIVER.

The management of the rural middle should be proposed under the perspective to recover and to maintain the integral operation of the territory, with all its cultural and natural diversity, and not to be centered in the conservation of species or particular wild communities. The management of the territory, therefore, should contemplate not only the natural values, but also the artistic, historic values and ethnographics of the rural middle as an inseparable reality of the landscape that receives them. These resources are susceptible of a respectful public use that contribute to the cultural enrichment of the population, to the generation of economic activity in the rural areas and, in final, to increase the appreciation toward this type of values by the society.



V.1. PROPOSAL OF SPATIAL ZONING OF THE USES OF THE TERRITORY WITH ENVIRONMENTAL BASE

The Sustainable Development Plan of the Natural Resources of the Region of the Northwest, according to the cultural and natural values of the zone studied, establishes the following zoning:

Areas Nucleus: constituted by all the zones protected or under protection commented in the section of appraisal of the natural middle. It includes the areas that require a greater level of protection by having an exceptional value.

Peripheral Zones of Protection: It understands the outskirts of the area nucleus and they are proposed in base to the quality of the landscape or by the fragility of the lands. These areas comply an important function in the maintenance of the ecological processes and in the cushionation of the impacts derived of the socioeconomic activities.

Ecological runners and of Biodiversity: They are lineal elements of the landscape proposed to connect remote areas protected and to conform thus a system more extensive. These spaces contribute to alleviate the effect of the fragmentation of their habitats and ecosystems, as well as the maintenance of species and ecological processes.

Area of socioeconomic influence: Rest of the territory, in where will be poured the benefits and objections of the conservation of the middle. Their purpose is to contribute to the maintenance of the areas nucleus and to the sustainable development of the zone of influence.

This zoning should constitute a frame of reference for the ordering of the uses and activities that develop or can be established in the zone, with a range of situations that go from areas of public use restricted, even limited, to zones with intensive public use. Nevertheless, this zoning is established to conserve the natural values of the territory. In the urban development planning should be taking into account, also, all the places of cultural interest situated in the areas of socioeconomic influence. Besides, the zoning of the area studied should be contemplated in the framework of an integral planning of the Region.

IV.2. INTEGRATION OF THE LOCAL POPULATION IN THE MANAGEMENT AND PLANNING OF THE TERRITORY

The acceptance and active participation of the local population in the conservation of the cultural and natural patrimony is an important challenge that there will be have resolve. This integration of the rural cultures in the management of the territory passes for improving their formation and by the



rewarding by the services that render the society, and not as occurs currently, that are the private owners and the farmers the ones that bear great part of the price of the conservation.

The politics of conservation and rural development should predominate the role of the peasants as agents of the territory through aids agroenvironmental and contracts of management or sustainable exploitation, that contemplate compensatory payments in exchange for certain requirements. Only like this way we will obtain the implication of the rural society in the sustainable management of the rural middle.

IV. 3. MANAGEMENT OF NATURAL SPACES PROTECTED OR UNDER PROTECTION

The management of the natural ecosystems protected or under protection should be presented since the perspective to maintain and to recover the elements and own natural processes of each space. For it, it is necessary to identify and to try to conserve and to maintain the species and key resources of which many species depend.

Many habitats contain a great diversity of species thanks to traditional practices of management and use of lands. In this way, the economic activities connected with the rural cultures, that do not represent a excessive exploitation of the middle, are fundamental for the maintenance of the landscape, the biodiversity, the environment and the general health of the system.

A crucial element of the strategies of conservation should be the protection of the biological diversity, so much outside like inside of the areas protected. If the areas that surround these spaces are degraded, the biodiversity of the interior will also diminish, especially in the small areas.

The areas protected or under protection should be endowed of the necessary installations to assure an orderly public use and the conservation or recovery of their landscape and ecological values. Between the installations and more prominent infrastructures we emphasize the related to the conservation and restoration of ecosystems, prevention and fight against forest fires, management of the contamination and the ordering of the public use.

The strategies of conservation should incorporate plans to educate the owners of lands and to compensate them for their work in the conservation of the nature.

IV. 4. MANAGEMENT OF TRADITIONAL AGROECOSYSTEMS

The Places of Interest Agroecologic, as the rice Enclosure of Calasparra or the traditional gardens, should include a figure of protection similar to the natural spaces. Nevertheless, does not it exist in our country a figure destined to protect the anthropical spaces . Only they keep in mind itself if possess a high environmental value, like the "Plain of Cagitán", that forms part of a ZEPA, but not by its agroecologic value (landscape or genetic or cultural resources).

For the management of these Agroecosystems, the peasants constitute, without doubt, the key of what the operation of all the system depends . Therefore, if we want to maintain our agrarian patrimony with all their elements, we should utilize all the available resources to maintain the key species in their niche. As it has been commented in a previous section, this only is possible if we improve its quality of life in the rural middle.

The cattle breeding constitutes also a key item for the traditional productive system. Besides diversifying the production (meat, milk, eggs, ...), contributes organic matter that favors the fertility, as well as the structure and biodiversity of the floor; diminishes the contribution of external chemists; contributes to the diversification of cultivations (forage species and of grazing interest) and to the use of residues and surpluses of crops.

Other elements of interest for the good operation of the traditional agroecosystems are the hedges, the rotation and association of cultivations and the use of local varieties.

The conservation of agroecologic spaces of interest should go accompanied by other measures that contribute to create a rural world alive, diversified and sustainable. Some of these measures should be related to the restoration of cultural and natural elements of interest for the appreciation of rural spaces (mining industry, agrarian practices and cattle raisers, manufactures, infrastructures, ...), interpretation centers creation, etc.

The modernization of irrigations, of great interest for the promotion of the sustainable use of the water resources, should be centered in the reconstruction of infrastructures with losses of water and in the application of measures to reduce the consumption of water. Nevertheless, according to the Development Plan and Ordering of the Natural Resources of the Region of the Northwest, the modernization of the irrigations should be compatible with the landscape, cultural, and environmental values. In this way, the hydraulic system of the traditional irrigations, with its network of channelings should not be covered for constituting a key item for the maintenance of the diversity of the flora and wild fauna associate to the agroecosystems. Besides, all the

infrastructures of historic or ethnographic interest should be conserved; as well as, the system of ponds and farmsteads that form part of the wetlands seminatural of ecological or landscape interest.

Ours proposed, for the management of the agricultural spaces, passes for restoring the natural vegetation in the fields abandoned or, in according to some cases, with aromatic plants, of grazing interest or of interest as biofuels. In any case with exotic plants to our flora. The fitogenetic resources of interest should be recover and conserve. For it, among others possibilities, would be able to utilize the farms of farmers interested in its cultivation; or well, in the farms that possesses the Administration in the mountains of Villafuerte, Ineffectual or Espuña.

In the measure of the possible thing, so much the spaces destined to the conservation of the traditional agriculture, as in the agricultural spaces situated in the interior of natural spaces should bet on systems of ecological production. They are the systems that more approach to the system of traditional production, at same time that contribute to the conservation of the environment and the natural resources, produces healthy and healthy food and permits to obtain a product of quality that reaches in the market a overprice, what favors the incomes of the farmers.

IV. 5. ECONOMIC DIVERSIFICATION OF THE RURAL MIDDLE

In the politics of development of the Rural Middle, the diversification of the economic activities should be a priority objective, to improve the quality of life of the population and to contribute with it to its settlement. The appreciation of endogenous genetic resources and the alternative tourism are found, next to other generating measures of employment, among the main proposals to contribute to the socioeconomic development of the rural zones.

IV. 5.1. VALUATION OF ENDOGENOUS GENETIC RESOURCES

The High Section of the Segura river, at the same as the remainder of the Region of the Northwest, counts on a great diversity of endogenous products "in danger of extinction" that are practically strangers by the consumers. Some of these products possess the sufficient quality as to swell the catalogue of food of quality of the Region of Murcia, next to products already valued like the wines originating in the variety Monastrell, the rice Bomb of Calasparra, sausages products or the cheese that came from the Murcia goat. Varieties horticulture local, honeys marketed in local street markets, or essences that are sold without transforming to foreign companies, constitute some of the resources of



interest that would be able to contribute to the economic diversification of the territory.

The first step, for the valuation of the endogenous products, consists of doing an inventory of the available resources. In this sense, the Agroecologic Network and Ecodevelop of the Region of Murcia (RAERM) has begun a study whose purpose is characterizing, to select and to conserve the local fitogenetic resources as base for the ecological production. With the results obtained the most productive species will be selected, of greater quality and better adapted to the ecological production. The selection of varieties is carried out with the participation of farmers, consumers and a Committee of Tries constituted by nutritionists, gastronomic critics and restaurateurs. The varieties selected will be distributed among the farmers for their production and conservation "in situ".

These products, with a good campaign of promotion and marketing, would contribute of significant form to the development of the tourism of the Region of the Northwest, through the rural tourism, the local street markets and the gastronomy in bars and restaurants. In this sense, will be necessary to create some signs of territorial identity based on its quality, differentiation and eating security.

IV. 5.2. ALTERNATIVE TOURISM. THE ECOMUSEUM LAND OF IBEROS

It is doubtless that, the ecotourism and the agrotourism, constitute one of the greater opportunities that offers the Network Nature 2000 for the development of the territory. The proposal of the RAERM passes for the promotion of diverse activities under the umbrella of an ecomuseo, called "Land of Iberos", on the one that already has begun to work.

The ecomuseum, that will be located in the center and northwest of the Region of Murcia, is conceived like an alive, open space, where the visitor enters, of a participatory and active form, in the forms of life of the territory. They are constituted by diverse elements distributed by a zone more or less extensive. These elements are representation of the natural middle, of the traditional activities, of the architecture and of the history of the territory.

V. CONCLUSIONS

The farmers and cattle raisers, with their strategy of management and use, have known to create and to maintain sustainable and productive ecosystems through the years. Nevertheless, the insufficient appraisal of the cultural, historic, landscape, and environmental qualities of the rural middle has conducted not alone to the absence of measures for their maintenance, but besides initiatives have been favored that promote the aging of the population and the absence of youths that want to remain in this middle.

To recover and to conserve the traditional landscapes is urgent to carry out works for know which are our cultural and natural resources and to try to recover them and to conserve them, together to the knowledge on the use and associated management to thoses resources; both indispensable and mutually dependent. The loss of one of them prevents the survival of the other. If we do not act fast, in some few decades there will be disappeared of our fields every sign of identity.

The conservation of the cultural and natural spaces cannot be carried out in no way without the commitment of the farmers and cattle raisers. Only its presence in the country and its commitment with the new more respectful attitudes toward the environment, can permit to conserve the natural and agrarian biodiversity.

It is necessary set in motion politics of Rural Development in the European, national, and regional field that contemplate the conservation and the development of our agrarian patrimony. These programs, among others actions, should include contracts of sustainable exploitation and agroenviromental direct aids to the farmers that be implied in the recovery and conservation of traditional agroecosystems.

The traditional agroecosystems well handled can be a source of activities and jobs in the rural middle. Indirectly because the tourist appreciation of the rural middle goes associate to landscapes and specific habitats, what requires his conservation and, eventually, his restoration. Directly because the activities and conservation of the agrarian biodiversity create opportunities of business and employment.