

# Migration and Population Decline in the Island of Vis, Croatia 1910-2001

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*This paper discusses the population dynamics of the island of Vis, Croatia and the geographical, demographic and social characteristics linked to the process. Demographic statistics and the results of the research show the substantial population decline of the island of Vis. The process began at the beginning of the twentieth century and it accelerated after the Second World War. Lasting unfavourable demographic processes (emigration, depopulation, demographic ageing, decrease of the fertility) resulted in a population that can be classified as of the following demographic type - very advanced old age.*

## *Introduction*

The Croatian archipelago includes nearly all the islands of the Adriatic's east coast and, according to its size (i.e. the number of islands), it is the second archipelago of the Mediterranean. The Croatian part of the Adriatic consists of 1.185 islands, islets, rocks and rocks awash (718 islands and islets, 389 rocks and 78 rocks awash). Fifty islands are constantly populated and there are 313 island settlements (with an average of 373 inhabitants *per* settlement in 2001). The surface of the archipelago is approximately 3.300 km<sup>2</sup>, or 5.8 percent of the surface of the continental part of the Croatian territory.

The Croatian archipelago was subject to population decline for decades and today (together with the mountain areas) is one of the most depopulated

parts of Croatia. Even back in the 1960s, it was possible to say '...that the islands, especially the smaller ones, are demographically dying out' (Friganovic, 1962:37). On the islands that did not engage in the tourist business in time, the emigration of the young population has all the characteristics of a complete exodus. Dying out is becoming the demographic perspective for more than the quarter of the island settlements (NEJAŠMIĆ, 1991). The fact that emigration is the main factor in population decline, itself indicates the deformed age and sex structure of the population, (the inevitable consequence of the selectivity of emigration). On the other hand, that includes the decrease of the fertile age groups, the weakening of the vital potential and the fall of the biorepro-

ductive power. In this way, population decline becomes even more the logic consequence of demographic ageing.

With the development of contemporary tourism and the rise of the social awareness of environmental issues, the archipelago once again is seen as one of the most valuable parts of the national territory. Concern for the problems of the islands has risen accordingly; the special attention of professionals and the general public is focused on the issue of demographic decline.

The population of the island of Vis has not escaped this decline. On the contrary, due to some geographical and other particularities, the island of Vis has had the most significant population decline of the fifteen biggest Croatian islands.

### *Geography*

The island of Vis, famous in history as the Greek Issa and later as Lissa, is one of the islands of the middle-Dalmatian archipelago (figure 1). It is 44 km from the closest mainland (Vinišće near Trogir) and, according to local standards, it belongs to the group of the so-called outer or open sea islands.

One of the specific characteristics of these islands is their isolation, that is, their separation from the mainland and other islands by the sea. Isolation has created special ecosystems and effects the entire socio-economic development, life conditions and the formation of the characteristic socio-psychological types of islanders and their communities (LAJIĆ, 1992). In the contemporary conditions of the spatial connectedness and socio-economic interrelations-

hip, the degree of an island's isolation depends on its distance from the coast and on the existing traffic connections with the coastal centres.

In the case of the island of Vis, its peripheral geographical position is fully expressed. Its distance to Split, the closest big coastal centre, is 55 km (figure 1). That distance is not so wide (especially in the global proportions), but it represents the significant 'barrier' to the accessibility of the coastal centres. Even today, Vis is outside of the commuting zone of the city of Split. The ferry-boat service between Split and Vis (the biggest island settlement), is the only regular service through the entire year and the voyage lasts for three hours, if the sea is still. The island's isolation, apart from the unsatisfactory connections, is also influenced by the price of the passenger and goods transport which is considerably higher in comparison to the price of the mainland traffic connections of the same distance.

Due to its outer, open sea position, the island of Vis has had great geostrategic importance in the nineteenth and the twentieth century. During the long period of the Venetian rule, it did not have the significant role, because it was outside the main naval routs that led along the eastern coast of the Adriatic (NOVAK, 1961). Under Austrian rule, Vis became the fortress of the Adriatic (until the 1873). After the surrender of Italy in the Second World War until the end of the war, Vis came to the centre of attention once again. It became the important military point through which the partisan movement received material aid from the western allies. In fact,



Fig. 1. Geographical position of the island of Vis in the middle-Dalmatian region

that was the beginning of the new era in valorising the strategic position of the island of Vis. After the Second World War, the Yugoslavian military strategists of that time considered Vis as the 'key of Adriatic'. For that reason, more than 18.000 barbed-wire posts were placed, a series of objects with different functions was built and a great number of bunkers, tunnels and shelters were constructed on the island. The island was closed to foreign tourists with the exception of a short period (1968- 1975). That significantly retarded development of the island's economy. Only when the autonomous and independent Republic

of Croatia was established, Vis stopped being the 'island-fortress' and started opening itself to the world.

#### *Natural resources*

The surface of the island of Vis is 90,3 km<sup>2</sup>; it is 17 km long at its longest part and 8 km wide at its widest part. According to its size, it is the tenth island amongst the Croatian islands. Two large bays are deeply embedded into the island's trapezoid, which stimulated the formation and the development of Vis and Komiza, the two most significant settlements of the island.

The island of Vis is characterised by the two limestone ridges which are,

considering the island's size, rather high (Hum, 587 m high). The ridges are separated by the two karst valleys which are covered by impenetrable sediments (ŠUŠNJAR, 1967). The sea shore of the northern island ridge is steep and inaccessible with the limestone cliffs. The southern island ridge is considerably more spacious with the larger number of small karst fields at the altitude of 100 and 250 m. Those are the richest soils of the island with numerous little settlements attached (figure 2). The southern slopes of this ridge are limestone so the shore is rocky, steep and inaccessible.

The island of Vis, as the whole middle-Dalmatian area, has the Mediterranean climate with dry and hot summers and mild and rainy winters. The acute summer aridity, additionally intensified by the karst terrain, has a large influence on the life of the islanders. The climatic element of the special importance is the wind; the life of the islanders, especially the ones related to the sea, fully depends on it. Vis is the Adriatic island most exposed to the winds. The wind also affects its agriculture, the position of the settlements, the connections with the mainland. Therefore, it is not surprising that the older islanders know and distinguish more than thirty types of wind according to the direction, strength, moving in currents, humidity etc. (FRLETA, 1958).

The island of Vis, like many other islands, suffers from deficiency of water. That is the consequence of the limestone geologic structure in which most part of rainfall is lost, together with its unfavourable distribution. Somewhat more significant water-springs are situated

in the proximity of Komiža. However, those water-springs have the limited significance for the island's water-supply. That is what caused the century-long islanders' struggle for water-supplies; they used to collect rain-water in public (village) and private (household) water-tanks.

In the absence of cultivable surfaces, shallow slope grounds were used. Thanks to the big effort of the local agricultural labourers, the terraces were formed and they are among the most impressive parts of the island's landscape. The terraced slopes are abandoned today, so the former olive-groves and vineyards are being more and more covered by the natural vegetation: garig, coppice and the forests of the seaside pine (*Pinus maritima*).

#### *Settlement structure*

The aforementioned natural conditions significantly determined the settlement structure, but the social factors determined its final form. As already noted, the two biggest settlements, Vis (1.776 inhabitants in 2001) and Komiža (1.523), rose and developed in the most suitable spots, at the bottom of large bays. Only three other smaller settlements are situated on the coastline: Rogačić (8 inhabitants in 2001), Rukavac (47 inhabitants) and Milna (19). The remaining eleven settlements are situated inland (0,8 to 3 km from the sea) and only Oključna (5 inhabitants) is outside the area of the main concentration of small settlements: Borovik (15 inhabitants), Podhumlje (40), Duboka (6), Podšpilje (14), Žena Glava (54), Dračevo Polje (8), Marinje Zemlje (35),

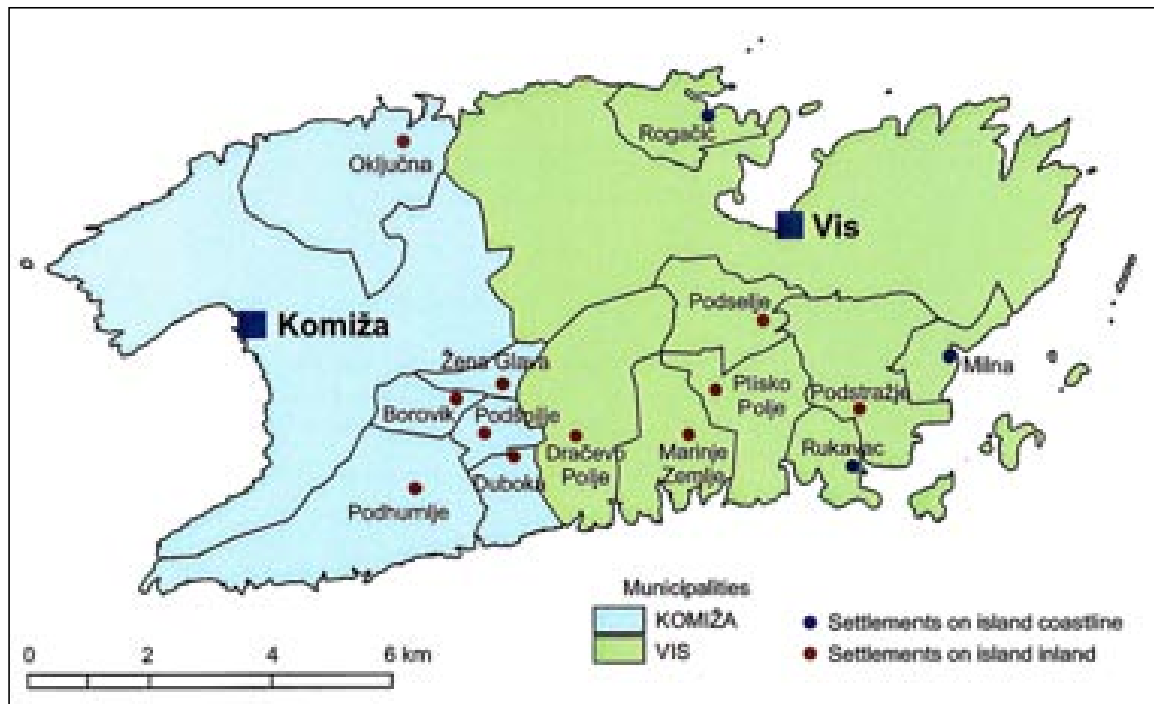


Fig. 2. *Settlements of the island of Vis*

Plisko Polje (21), Podselje (23) and Podstražje (23). At the time of the maximal island population density (1910), between 17 (Dračevo Polje) and 355 inhabitants (Podhumlje) lived in these settlements. Settlements in the island's interior rose at a time of considerably different social and spatial relations and their position and size was determined by the disposition of the more valuable agricultural land.

#### *Settlements of the island of Vis*

The island of Vis is characterised by a distinct bipolar functional spatial organisation with Vis and Komiža as central settlements; 93% of the entire island population lives in the two settlements. The existing social infrastructure of these settlements provides only for the primary needs of the island's

population. In order to provide for the other needs, the population is directed to the remote Split, which in this case has the function of the regional centre. Nowhere else in continental Croatia, or its surroundings, the regional centre is three-hours-drive away (in the case of Komiža, another half an hour of bus-drive to Vis should be calculated). That undoubtedly contributes to the island's isolation, its socio-economic lagging behind and high level of emigration.

#### *Population Change*

Since 1910 Census data clearly show that the island of Vis has been an area of continuous decline. (table 1). The biggest number of inhabitants was recorded in 1910, when Vis was the most densely populated Dalmatian island (108 inh./km<sup>2</sup>).

*Table 1. Changes in the number of inhabitants of the island of Vis in the 1900-2001 period (for census years)*

| Year  | Population | Basic Index<br>(1900=100) | Chain<br>Index |
|-------|------------|---------------------------|----------------|
| 1900  | 9 650      | 100,0                     | -              |
| 1910  | 9 810      | 101,7                     | 101,7          |
| 1921  | 9 511      | 98,6                      | 96,7           |
| 1931  | 8 496      | 88,0                      | 89,3           |
| 1948  | 7 230      | 74,9                      | 85,1           |
| 1953  | 7 643      | 79,2                      | 105,7          |
| 1961  | 6 834      | 70,8                      | 89,4           |
| 1971  | 4 970      | 51,5                      | 72,7           |
| 1981  | 4 090      | 42,4                      | 82,3           |
| 1991* | 3 856      | 40,0                      | 94,3           |
| 2001* | 3 566      | 36,8                      | 92,5           |

\*Due to the changed methodology in the 2001 census and in order to make the two last censuses more comparable, the data of the population "in the country" was used. The total number of inhabitants (including the contingent abroad) was 4 338 in 1991, and 3 617 in 2001.

Source: KORENČIĆ, 1979 for the 1900-1971 period; population censuses, Croatian Central Bureau of Statistics, Zagreb, for the years of 1981, 1991 and 2001.

In the period from the 1900-2001, the number of inhabitants decreased by 63.2 percent, which is over twice that of the entire Croatian archipelago (30.0 percent). At the same time, the number of inhabitants of Croatia as a whole increased by 32.9 percent (Fig. 3).

It is important to stress that the difference in population decline between the Municipality of Komiza (seven settlements) and the Municipality of Vis (ten settlements) is inconsiderable: Vis 63.4 and Komiza 62.9 percent.

On the other hand, the differences between the coastline settlements and the ones in the interior are considerable. In the 1900-2001 period, settlements on the coastline (Vis and Komiza include 98 percent of the population of the coastline settlements) recorded a 58.1 percent decrease in the number of inhabitants. For the settlements in the island interior, the corresponding decrease was 86.0 percent.

Such differences were to be expected. It was already noted that the interior is characterised by the small settlements and that the population of those settlements is traditionally engaged with agriculture and cattle-breeding. When the processes of urbanisation, deagrarianisation and deruralisation came to Croatia in full swing, the small rural settlements were the most affected by emigration and population decline (NEJAŠMIĆ, 1991a).

In the entire century, population increase was registered only in two inter-census periods. In the 1900-1910 period, the increase was rather insignificant (0,16% *per annum*), while in the 1948-1953 period it was somewhat more significant (1,11% *per annum*). The increase in the post-war period can be explained by the fact the emigration to foreign countries was not permitted. Apart from that, industrialisation and deruralisation were not strong enough to stimulate internal migrations. According to the data (table 1), the most significant population decline before the Second World War was registered in the 1921-1931 period (average of 1,13% *per annum*).

In the post-war period, the decline

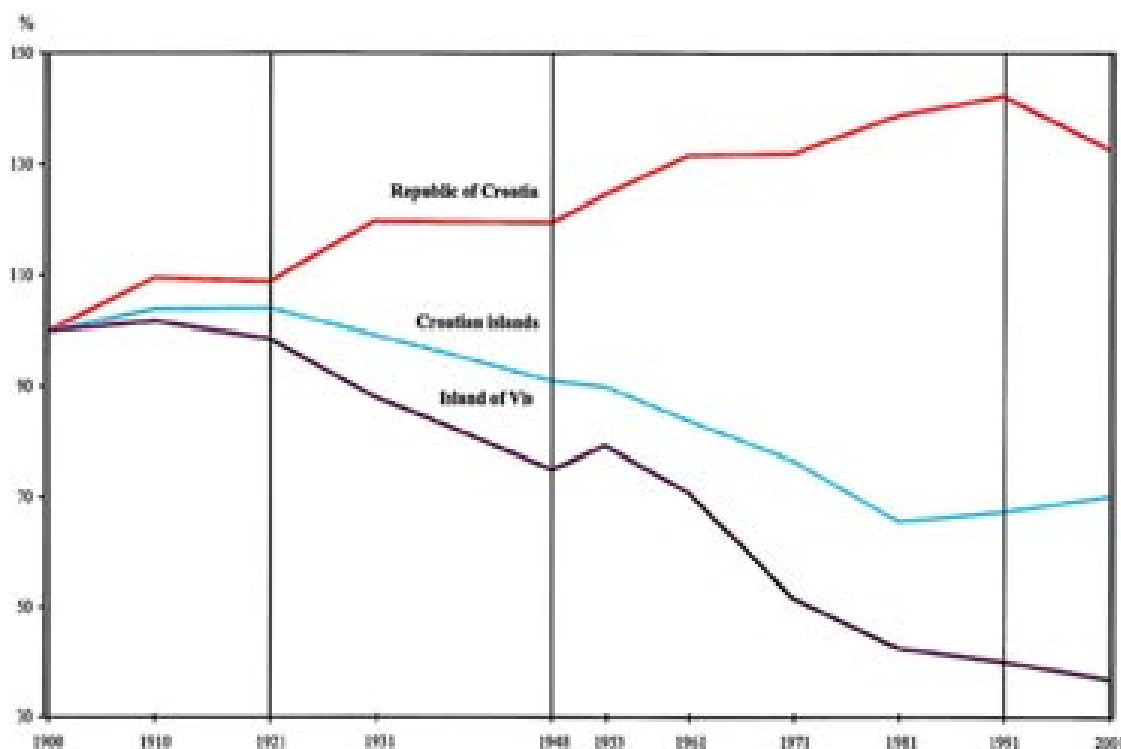


Fig. 3. Population dynamics of the Republic of Croatia, Croatian archipelago and the island of Vis for 1900-2001 period, for the census years (1900= 100,0)

intensified. The most significant population decline was registered in the decade 1961-1971 (3,16% *per annum*), followed by the period of 1971-1981 (1,94% *per annum*). That kind of dynamics was congruent with the general conditions of the time when the focus of socio-economic development shifted to urban-industrial centres. The mass transfer of agriculturalists to non-agricultural activities followed, coupled with the abandoning of the country and the general neglect of rural values (PULJIZ, 1977).

The differences between the inland and the coastline settlements are also visible in the intensity of the change of the numbers of inhabitants in the particular inter-census periods. Starting

as early as 1910 (with the exception of 1948-1953 period), the settlements on the coast (Vis and Komiža) were continuously losing people, while the settlements in the interior registered some stability, until 1953. Since then, the interior settlements also register an abrupt fall in the number of inhabitants (Figure 4).

#### *Emigration*

Since the island of Vis was characterised by the positive natural population dynamics until the 1960s, it is easy to conclude that the main factor of population decline, until then, was emigration. Two phases of emigration can be distinguished: the first, before the Second World War, which was dominated by emigra-

tion to foreign countries, especially to transatlantic countries, and the second, after the Second World War, with the growing significance of internal migra-

for immigrants, it is possible to consider the resulting sums as the numbers of emigrants, of course with some caution. The other difficulty is the absence of the

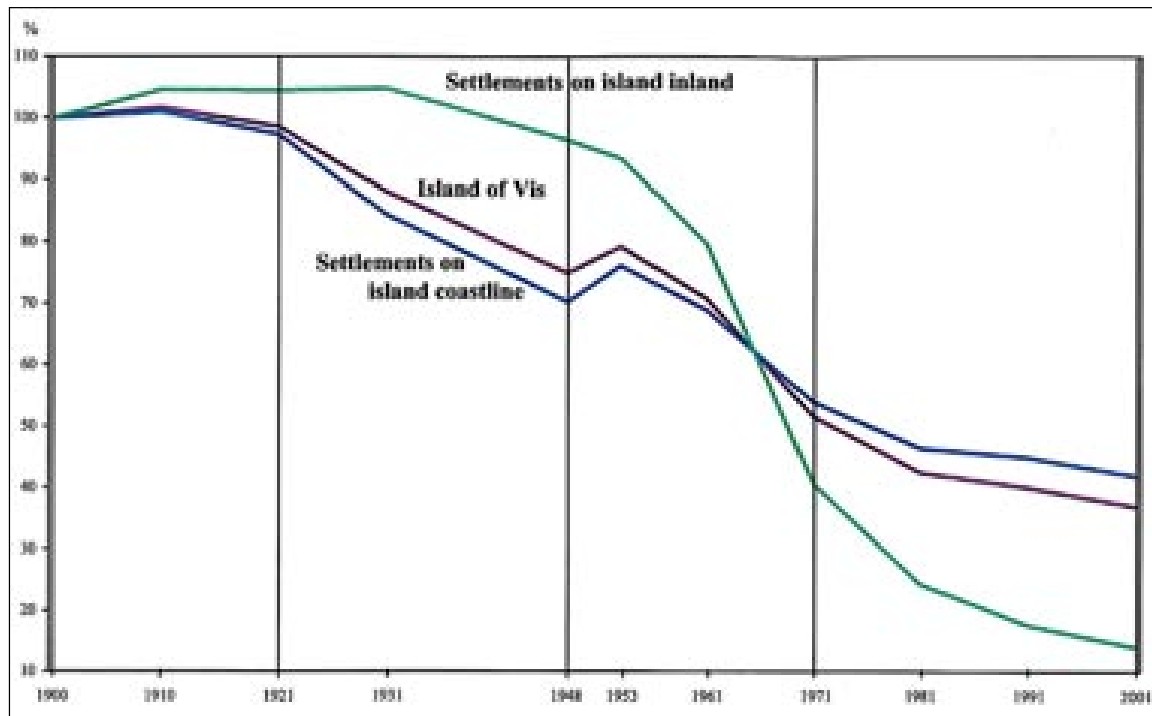


Fig. 4. Population dynamics of the island of Vis, coastline and inland settlements in the 1900-2001 period, for census years (1900 = 100,0)

tion, especially emigration from the island to Split and other centres on the mainland. In the absence of data on the numbers of emigrants from the island of Vis, and even the absence of the relevant estimates, we shall try to estimate the number using the vital statistics method. It is based on the comparison of data for the total population dynamics and the natural increase between the two censuses. The result represents the net migration, i.e. the difference between the number of the persons who immigrated and emigrated from the specific area. Regarding the fact that the island of Vis was not an attractive destination

reliable sources on natural population dynamics. Therefore, the rates for the whole Dalmatian population have been used for the island of Vis (following GELO, 1987).

The results show that in the first half of the twentieth century, around 6,500 inhabitants emigrated from the island of Vis, or around 135 *per annum* (table 2). In that wave, the entire natural increase in the population was lost (it was approximately 4,000 persons), including part of the basic population. Further, it is evident that there was significant emigration in all inter-census intervals. Emigration that was above the average



occurred in the 1921-1931 period when 2.000 (exactly) people emigrated, on average 200 *per annum*. Out of the total number of inhabitants who left their home island, most of them migrated to foreign countries. According to the information we obtained from older islanders, leaving Split or other parts of the country was not especially significant. We can therefore estimate that, in the first half of the twentieth century, around 5,500 inhabitants of the island of Vis went abroad, particularly to the United States, South America, Australia and New Zealand. The most famous immigrant enclave of the former resi-

dents of Komiža is in San Pedro, where they continued their engagement in the fishing industry and greatly advanced that aspect of the economy in California.

Causes of the emigration before the First World War can be found in the general economic and political backwardness of Dalmatia, which existed at the edge of the state 'like the empire's appendage'. In the region with poor quality soil and with unfavourable climatic conditions (summer aridity), most of the population nevertheless engaged in the agriculture (FORETIĆ, 1969). Direct causes of the emigration

Table 2. *Migration balance of the population of Vis 1900-1948, inter-census intervals.*

| Year                                     | Listed number of inhabitants | Natural population increase between the two censuses* | Expected number of inhabitants, based on population increase | Migration balance** |
|--|------------------------------|---|--|---------------------|
| 1900                                     | 9650                         |   |  |                     |
|  |                              | 1255  |  |                     |
| 1910                                     | 9810                         |   | 10905  | - 1095              |
|  |                              | 942   |  |                     |
| 1921                                     | 9511                         |   | 10752  | - 1241              |
|  |                              | 997   |  |                     |
| 1931                                     | 8496                         |   | 10508  | -2012               |
|  |                              | 850   |  |                     |
| 1948                                     | 7230                         |   | 9346   | -2116               |
| <i>Total migration balance 1900-1948</i> |                              |   |  | <i>-6464</i>        |

\* Calculated by the authors based on annual natural change rates, following GELO, 1987.

\*\* Difference between the actual and the expected number of inhabitants.

from the island of Vis were the viticulture crisis (that hit the whole of Dalmatia) and the decline of fishing.

Viticulture was by far the most important agricultural activity of the Dalmatian agricultural labourers, including the ones from the island of Vis. The greatest part of the cultivable soil was covered by vineyards. In the year of 1900, out of the total of 2.825 ha cultivable plots on the island of Vis, even 96,6 percent were under vineyards (PERIČIĆ, 1999). Wine growing started in the 1870s, with the growing demand for wine in the French market (the consequence of *Phylloxera* which had devastated the French vineyards). After the renewal of the vineyards, the French market was closed to foreign wine import. That was the beginning of the wine crisis in Dalmatia which hit all social strata, from agricultural labourers to tradesmen. The only way out was re-orientation to the internal market. Once in the crisis, the Dalmatian viticulture was hit by an even harder blow - a trade treaty between Austro-Hungary and Italy. The beginning of its application was February 1st, 1892 and the treaty enabled Italy to find a market for its wine in the great empire under the favourable conditions (PERI, 1978). The prices of wine started to drop rapidly and, once the *Phylloxera* appeared in Dalmatia, the region was hit by severe economic crisis.

Life on the island of Vis was unimaginable and unsustainable without the fishing. With the lack of the fertile soil (especially surrounding Komiža), the local population got involved into fishery in order to secure the means for life. At the beginning of the twen-

tieth century, Komiža became the main fishing centre of the whole Dalmatia. Fishermen from the island of Vis, and especially from Komiža, were famous for their experience and skill. But on the eve and during the First World War, fishing was hit by a decline in the hauls of sardines and other fish. The Brijuni convention in 1923 limited the right of the inhabitants of Komiža to fish in the waters of Palagruža, the island that fell under Italy's rule. All of that left a deep mark on the fishing industry of the island of Vis, which is also visible from the following data: in 1924 there were 745 fishermen and 149 boats, in 1926 there were 365 fishermen and 69 boats (PERIČIĆ, 1999).

The political and economic situation in the interwar period was, in a certain way, a continuation of the previous situation under the Austro-Hungary. Most of the population continued working in agriculture, while several hundreds of workers found work in Komiža's fish factories (in 1923, there were even seven departments for sardine processing). Nevertheless, the island had more available work-force than work-places. Few opportunities outside agriculture were the cause of the incessant splitting of agricultural estates and the creation of smaller and smaller properties. The agrarian population density was enormous. In 1931, Vis had approximately 240 agriculturalists (including the supported family members) *per* 100 ha of cultivable soil. At that time, in the developed parts of Europe, there was a shared opinion that the optimal density was 35 to 45 agriculturalists *per* 100 ha of cultivable soil (BIČANIĆ, 1940).

The way out of agrarian overpopulation was the enlargement of the cultivable plots, which, in the case of the island of Vis, was not easy to accomplish. If a piece of land was laboriously transformed into the cultivable plot (e.g. terraces), that enlargement would be annulled by the natural population increase. The second possibility was industrialisation, which was completely limited in the given conditions. Finally, the third possibility was to leave the island and it was used frequently.

After the Second World War, rather high agrarian density continued to exist for another ten years. Therefore, it was

still a strong emigration push factor. Emigration was mostly directed towards Split and other urban-industrial centres on the mainland. But the emigration to foreign countries still existed as well, especially after the opening of the borders in the mid-1960s.

It was already mentioned that the most significant population decline followed after the 1961. At the beginning of the 1960s, the official statistics started keeping records of the natural population dynamics at both the communal and settlement level. Therefore, it is possible to calculate the migration balance using the vital statistics method.

Table 3. *Migration balance of the population of Vis 1961-2001, inter-census intervals.*

| Year                                     | Listed number of inhabitants | Natural population increase between the two censuses* | Expected number of inhabitants, based on population increase | Migration balance** |
|--|------------------------------|---|--|---------------------|
| 1961                                     | 6834                         |   |  |                     |
|  |                              | -195  |  |                     |
| 1971                                     | 4970                         |   | 6639   | - 1669              |
|  |                              | -274  |  |                     |
| 1981                                     | 4090                         |   | 4696   | - 606               |
|  |                              | -366  |  |                     |
| 1991                                     | 3856                         |   | 3724   | 132                 |
|  |                              | -404  |  |                     |
| 2001                                     | 3556                         |   | 3452   | 104                 |
| <i>Total migration balance 1961-2001</i> |                              |   |  | -2039               |

\* Calculated by the authors based on the census data and official vital statistics of the Croatian Central Bureau of Statistics.

\*\* Difference between the actual and expected number of inhabitants.

In the period from 1961-1981, more persons (2,275) emigrated than immigrated (therefore, it is the smallest possible number of emigrants). It represented 33.3 percent of the entire island's population at the beginning of the period in question (1961). Likewise, it is important to stress that the migration is 'responsible' for the 82.9 percent of the decrease in the population in the 1961-1981 period (decrease amounts to 2,744 persons, table 1); the remaining 17.1 percent is the result of the negative natural increase.

After 1981, positive migration balance was recorded, even though it was not very significant. This means that the population decrease in the 1981-2001 period (decrease amounts to 534 persons) was exclusively caused by the negative natural increase.

What had happened? Had the island become an attractive immigration destination? The answer is manifold. Firstly, one should bear in mind that the contingent of young population has completely narrowed - the main emigration base. Secondly, the demographic pressure to the island's resources weakened; in comparison to the 1953, the number of inhabitants had halved. Thirdly, emerging tourism, directly or indirectly, stimulated new work-place openings. Fourthly, orientation to the market economy offered new possibilities for the valorisation of the island area. But, it seems artificial (administrative) immigration also exists. Particularly, a lot of the owners of summer-houses and places for rent to the tourists have declared their place of residence at the island of Vis in order to avoid paying

real estate taxes. Whatever the truth, it seems that Vis reached the point where the stabilisation and even the increase in the positive migration balance can be expected. In that case, the further possible population decrease will be exclusively affected by the negative natural dynamics.

#### *Natural population dynamics*

It is important to note that the emigration has two time effects: a) the momentary, instantaneous one which immediately changes the number of the population, and b) the long-term (delayed) effect which follows out of the instantaneous one and '...it is manifested in the fact that the inhabitants, who leave their home area, at the same time "take away" the future births, deaths, marriages and divorces they would experience during their lifetime in the place of their origin, if they had not emigrated' (WERTHEIMER-BALETIĆ, 1999: 284). Apart from that, concerning the selectivity of migration (and it is well known that it is younger persons who are emigrating), certain population structures in the emigration areas, such as the island of Vis, alter as well. They then create the conditions for the future natality and mortality dynamics.

The delayed effect of the emigration on the natural dynamics was fully evident after the Second World War; it was stimulated by the war demographic losses as well. Simultaneously with the development and the modernisation of society, natality transition took place (changes in the number of children *per* family). Total fertility rate (TFR), as the best aggregate indicator of repro-

duction (it is possible to say, the average number of children in the family), records low values. In the 1990s, long-term unfavourable dynamics obviously accelerated. In the 1991 the TFR for the middle-Dalmatian group of islands amounted to 1,67 (NEJAŠMIĆ, 1997). It is possible to assume that it is identical for the island of Vis, as for the entire middle-Dalmatian archipelago. On the other hand, the total fertility rate for Croatia in the 1990 was 1,75; it dropped to 1,35 in 2000. We can estimate that the TFR was 1,25 for the island of Vis. It is almost less than a half of the critical value of TFR (2,1) which (theoretically) guarantees simple reproduction; therefore, the generation renewal is not assured.

The fertility rate of the population of Vis is constantly decreasing (Figure 5, following page). At the beginning of the 1960s, it was approximately 12 ‰, to drop to around 9 ‰ at the end of the 1990s (Figure 5). On the other hand, in the same period the mortality rate increased from approximately 14 ‰ to the high 21 ‰. The vitality index (the number of births *per* 100 deaths) shows more and more 'liabilities'. In 1961, the vitality index for the population of Vis had the amount of 105.3 (it was 180,5 for the total population of Croatia), in 1981 it was 57.0 (Croatia 134,2), in 2001 it was 27.8 (Croatia 92,7). It is clear that the death dominates in the kind of 'life and death' balance of the island of Vis, starting already at the beginning of the 1960s.

The island interior, where mainly the (not numerous) older population remained, is characterised by the especially

adverse natural dynamics. In the village of Žena Glava, the biggest settlement in the inland, only 13 children were born in the period of 1963 to 2001, and none in the last five years. Therefore, it is self-evident that the settlement in question and ones like it are on the verge of dying out. In the near future, those settlements will lose their permanent and native-born inhabitants.

We can state that on the island of Vis (bio)reproduction of the population is significantly under the level that would guarantee the simple renewal and that the unfavourable dynamics is becoming more and more severe. Strong reproductive and generational population decline is at work.

#### *Age and Sex Structure of the Population*

The sex (and age) population structure is not influenced solely by the natural dynamics, but also by the migration and other factors (especially wars). Therefore, interruption of the numerical relation is a common phenomenon. This is also the case with the population of Vis.

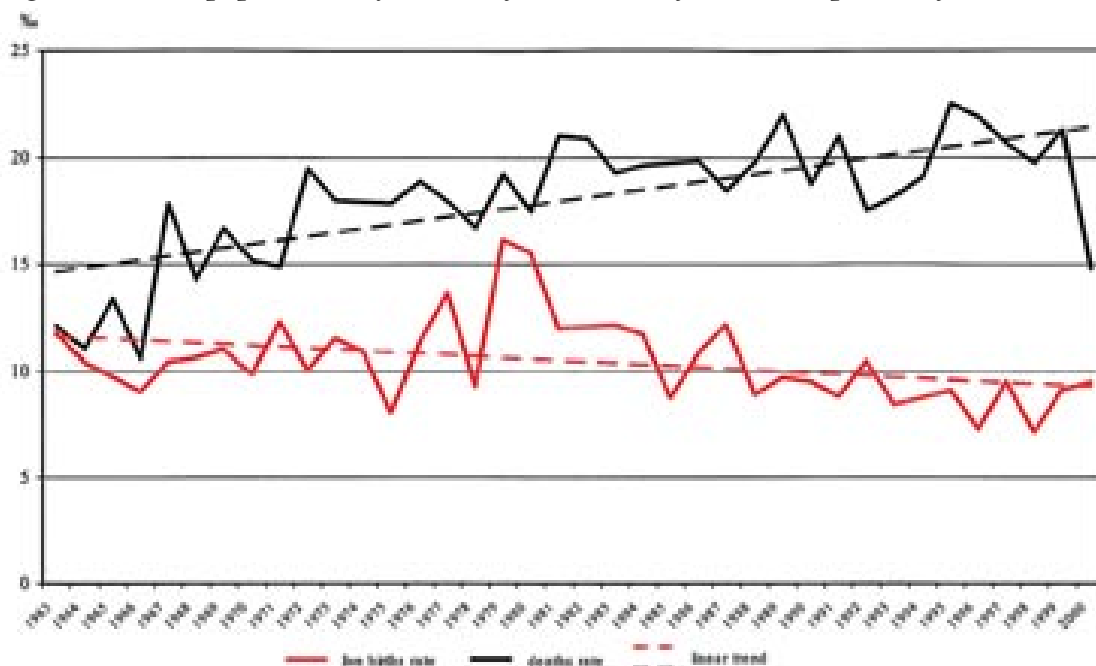
The general coefficient of femininity ( $k_f$ , marks the number of female *per* 100 male inhabitants) for the year of 2001 was 108,6; the comparison with Croatia (111,4) does not show a significant difference. For that reason, it is important to examine the indicators according to single age groups. Especially indicative is the imbalance in the age groups of 20-34 (the extended group of the so called marital age). The imbalance directly affects the number of marriages (nuptiality) and, by that, the general level of the fertility as well. The

coefficient of femininity for those age groups for the population of the island of Vis in the 2001 was 84,3, while it was 102,1 at the level of Croatia. For the population of the island's interior, the marital age group has significant imbalance, the coefficient of femininity is 57,1 (the population is small so the relations have a different weight; there are 14 men and 8 women in that group). Significant absence of female inhabitants in the age group of 20-34 is not a particularity of Vis; it is a characteristic of all depopulated rural areas (NEJAŠMIĆ, 1991a). It can be explained by the selectivity of emigration according to gender. In other words, in the first phase of the rural exodus, men leave to find work, while the women do not have enough reasons to leave because they cannot find work outside the village. Once the emigration from

the village gains momentum, the women leave faster than men and in larger numbers. Because of the system of successive inheriting, the men are more attached to their estates. 'All research shows that the women are, in fact, more sensitive than men to the hardships of the life in the country' (MENDRAS, 1986: 207). The population imbalance of the sexes in the most vital age groups contributes to the further population decline of the island of Vis because, by chain reaction, it leads to (bio)reproductive disorders.

The age structure of the population is one of the most important indicators of the potential liveliness and biodynamics of the population of the certain area and it is especially important because of its social and economic implications. What is the situation on the island of Vis? The population of the island was already caught up by the process of demographic

Fig. 5. *Natural population dynamics of the island of Vis in the period of 1963-2000*



ageing in the 1953 (the proportion of the inhabitants of the 65 and more was higher than 8 percent). Primarily, that was the result of the many decades of the substantial emigration and the significant selectivity of migration according to age (generally, the younger persons are leaving). By the end of the century, the population of Vis was strongly affected by that undesirable process. Out of the comparison to the entire population of Croatia, which is also caught by the process of demographic ageing, it is evident that all the parameters of the population of Vis are significantly more unfavourable (table 4, following page).

On the island of Vis, every fourth inhabitant is 65 years old or more. The percentage of 'grandparents' (65 and more) is nearly twice bigger than of the percentage of the 'children' (0-14). The coefficient of age dependency of the old population is significantly high as well. Average life expectancy is 44,3 years and it is even five years higher than the average age of the population of Croatia. The structure of the population of the interior settlements of the island is especially unfavourable.

We already stressed that the population decline in those settlements is quite significant, so the bad demographic picture is entirely expected. Almost half of the population belongs to the contingent of elderly persons, while the young persons are under nine percent (there are 56 elder *per* 10 young inhabitants). There are twelve persons in the post-working age *per* ten persons in the working age. Average age is very high, 57 years. Everything points to the fact that the villages in the interior of the

island have become the communities of old people's households, with less and less youth and successors. It is not the isolated case of Vis, but the characteristic of the entire Croatian archipelago (NEJAŠMIĆ, 1992).

It is unnecessary to explain the consequences of the old composition of the population. It is enough to point to the fact that it significantly decreases the (bio)reproduction of the population and leads to the so-called biological population decline (population decline as the result of the negative natural increase in the population). The old population is characterised by the decrease in the economic activity and the social and cultural life declines as well.

It is possible to assert that the observed differences in the age and sex structures are the main malady of the island's population dynamics, and they are clearly demonstrated by the so-called age-sex population pyramid. It reflects the past, the present and the future of a population. The eroded age-sex structure of the population of the island of Vis is reflected in the asymmetrical pyramid (Figure 6). It belongs to the old (contractive or regressive) type of the pyramid shaped as the urn (it can have the symbolic meaning as well). The pyramid's base ('children's base') is significantly narrowed, the middle part is convex and the 'head' (the old population) is much wider than the base. This type of the pyramid points to the low and decreasing natality and to the negative natural population increase. This description obviously corresponds to everything we 'diagnosed' when discussing the demographic processes on the

Table 4. *Analytic indicators of age structure of the population of Vis, inland settlements and Croatia in 2001*

|   | Island of Vis | Settlements in the island inland | Croatia |
|---|---------------|----------------------------------|---------|
| Percentage of youth (0-14)                            | 14,0          | 8,8                              | 17,0    |
| Percentage of the elder (65 +)                        | 24,5          | 49,4                             | 15,6    |
| Index of ageing*                                      | 175,2         | 561,9                            | 91,9    |
| Coefficient of age dependency of the old population** | 40,5          | 112,4                            | 26,0    |
| Average age   | 44,3          | 56,9                             | 39,3    |

\* Showing the numerical relation of the elder (65 +) *per* 100 young persons (0-14).

\*\* Showing the numerical relation of the persons in the post-working age (65 +) *per* 100 persons in the working age (15-64).

Source: Calculated by the authors according to the data: Population Census 2001, Croatian Central Bureau of Statistics, Zagreb.

island of Vis.

On the pyramid, it is possible to notice the niches (grooves of trenches) pointing to the influence of some specific factors (emigration, wars). The previously mentioned absence of women in the age of 20-34 and the common surplus of women in the older age groups is noticeable. The deep niche in the 55-59 age group is especially visible. The contraction of that age group was affected by the two factors (if the mortality is omitted): a) the fertility decrease during the Second World War (the age group in question was born between the 1942 and 1946) and b) in the time of the most significant exodus from the island (1961-1971), the most part of that age group were between 14 and 24 years old

and were more intensively affected by emigration.

For the settlements in the island interior with the most substantial population decline, the age-sex population pyramid is completely deformed with the shape of the inverted pyramid (figure 6). The base of the pyramid is very narrow and the "head" is very wide and extremely asymmetrical (surplus of the female population). The aforementioned absence of the female population in the marital age group (20-34 years) is visible as well.

The age structure is not merely the consequence of the unfavourable demographic dynamics, but it is the important factor for future population changes. For that reason, the considera-

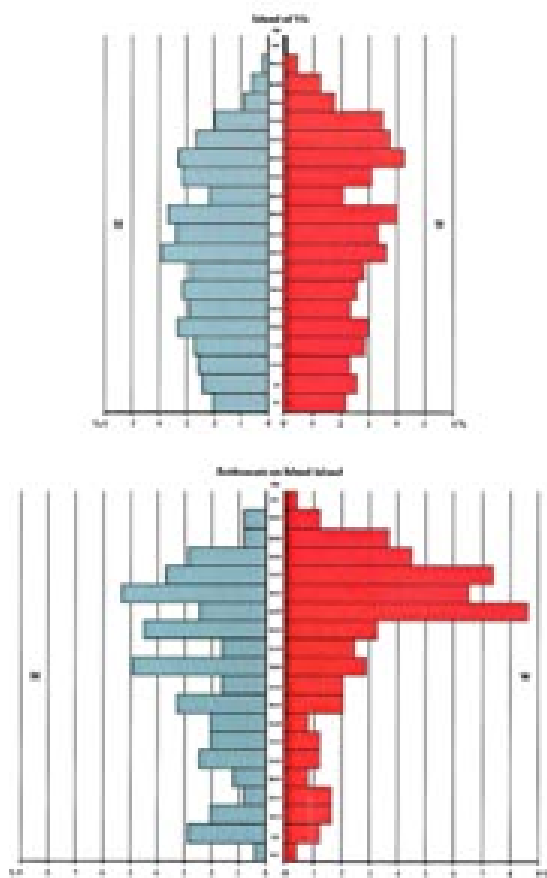


tions of the age structure tend to more precise evaluations. Since the island of Vis represents the case of the advanced process of demographic ageing, the evaluation should be adapted to that fact and types should be created for the various stages of the population's ageing. Instead of the classification based on the mere combination of 'young' and 'old', the indicator of population ageing was obtained by the special pointing method. The classification of the seven types (degrees) of ageing was created, and every type has the corresponding

descriptive characteristic: 1) on the verge of ageing, 2) ageing, 3) old age, 4) the advanced old age, 5) very advanced old age, 6) greatly advanced old age and 7) extremely advanced old age (NEJAŠMIĆ, 2005).

It was possible to classify the entire population of the island of Vis in 2001 as the 5<sup>th</sup> type - very advanced old age. The population of island's interior belonged to the 7<sup>th</sup> type - extremely advanced old age. For comparison, the population of Croatia belongs to the 3<sup>rd</sup> type - old age (but it is on the verge of crossing into the 4<sup>th</sup> type). It has become evident that, on the island of Vis, the stage of the population ageing could easily lead to the worsening of the already unfavourable conditions and even to the demographic dying out of the small settlements.

Fig. 6. Age-sex population pyramid of the inhabitants of the island of Vis and inland settlements for 2001



### Conclusion

We can conclude that the island of Vis, apart from the substantial population decline in the twentieth century, is also affected by the advanced process of demographic ageing. Population decline, on the other hand, has passed its way from the consequence of the social events to the important factor of the social and spatial processes. The erosion of the age population structure we demonstrated, undoubtedly leads to serious consequences. It unfavourably affects the series of social and economic parameters with the possible result of emigration of the remaining part of the island's youth. In that way the socio-demographic depression is deepening and it limits the possibilities of stabilising unfavourable demographic

and developmental tendencies. The experiences of the developed countries show it is not possible to stop depopulation tendencies unless socio-economic circumstances change considerably. In other words, only the socio-economic revival can cure the consequences of the substantial emigration and denatality more permanently and revitalise the part of the island settlements. In that case the islands, including Vis - the 'island rich with the time', will become the Croatian developmental advantage.

It is important to point to a certain doubt concerning the general development of the Croatian islands in the light of current and future demographic characteristics. Namely, it is the question whether the population should follow development or, conversely, should development be adjusted to the population. The view that it is not acceptable to force development over the needs of the local population is becoming more and more common. When the islands are in question, it is necessary to find the balance which would respect the material and the spiritual wealth of the people and preserve its foundation.

The islands represent the extremely valuable and very sensitive geographical, economic and anthropogenic surroundings. When discussing the Croatian archipelago, it is important to stress the specific complex of the developmental characteristics, the surroundings and the mentality, i.e. the unique harmony of the natural and cultural landscape. Therefore, when creating the developmental strategy, it is necessary to respect the special characteristics of single islands or island groups.

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