

ANNEX 6 to

Work package 2 report

Task 2.7

Discussion of hypotheses, conclusions

Željka Musović

Wolfgang Pfefferkorn

11.2.2003



Table of Content

1. INTRODUCTION.....	3
2. SUMMARIZING KEY FINDINGS AND HYPOTHESES ABOUT THE INTERRELATION BETWEEN REGIONAL DEVELOPMENT AND CULTURAL LANDSCAPE CHANGE IN THE ALPS	4
(1) Urban as well as the sub-and peri-urban areas are the centers of growth (sub-trends 1.2, 1.4 and 1.5).....	5
(2) Tourism-dominated areas are the second pole of growth (sub-trends 6.1 and 6.2).....	5
(3) The stagnating balance (Sub-trends 2.1 and 2.2)	6
(4) Rural areas ‘in between’ without specific potentials are facing a remarkable crisis (sub-trends 1.1 and 1.3).....	6
(5) Sector-dominant development trends (agricultural, industrial or service) do not play an important role (sub-trends 3, 4 and 5)	7
3. COMPARING GENERAL RESULTS WITH THE RESULTS IN PILOT REGIONS.....	7
3.1 Comparison in detail	7
3.2 Further key findings in pilot regions.....	19
4. HYPOTHESES ON FURTHER DEVELOPMENT	22
(1) Polarisation will continue	22
(2) Increasing land use conflicts versus extensification	23
(3) Traffic growth.....	23
(4) Agriculture: concentration versus extensification	23
5. COMPARING RESULTS AND HYPOTHESES WITH OTHER CURRENT RESEARCH WORK.....	24
6. LITERATURE	37

1. INTRODUCTION

In this report the findings of WP2 Task 2.3 (Data processing and analysis), the main description of development trends and the interrelation to cultural landscape were examined by the findings of the different pilot regions (section 2). This examination lead to hypotheses on further spatial development and on the interrelation with cultural landscape change in the Alps (see section 3). Finally the findings and hypotheses on the level of the whole Alps as well as on the level of pilot regions have been compared with recent research studies and projects (section 4).

2. SUMMARIZING KEY FINDINGS AND HYPOTHESES ABOUT THE INTERRELATION BETWEEN REGIONAL DEVELOPMENT AND CULTURAL LANDSCAPE CHANGE IN THE ALPS

Tab. 1: Indicators 1981-1991, total Alps

Indicator	1981	1991	1981-1991	81-91 in %
Population				
Inhabitants	11.117.956	11.676.897	558.941	5,03
%tage of communities with decline of inhabitants between 81 and 91		32%		
Migration			408.875	3,68
Population in productive age	7.179.613	7.640.406	460.793	6,42
Population in productive age in %				
Working places				
Working places	2.733.419	2.994.049	210.630	7,71
%tage of communities with decline of working places between 81 and 91		46%		
Commuter balance (in minus out)	56.654	-415.473	-472.127	
Commuter ratio	1,23	-8,29	-9,52 ¹⁾	
Settlements				
Residential buildings	3.992.644	4.627.383	634.739	15,90
Tourism				
Touristic beds	2.869.609	2.836.102	-33.507	-1,17
Agriculture				
Agricultural businesses	586.523	502.758	-83.765	-14,28
Full time agricultural businesses	220.571	177.173	-43.398	-19,68
Part time agricultural businesses	351.989	315.339	-36.650	-10,41
%tage of full time businesses	37,61%	35,24%		-2,31
%tage of part time businesses	60,01%	62,72%		2,71
Cattle per farm	14	17	4	26,28
Agricultural land use				
Total agricultural land (ha)	3.873.435	3.701.168	-172.267	-4,45
Arable land	701.619	615.136	-86.483	-12,33
Permanent crops	167.787	162.244	-5.543	-3,30
Intensive grassland ²⁾	850.330	837.822	-12.508	-1,47
Extensive grassland ²⁾	1.687.337	1.672.671	-14.666	-0,87
%tage of arable land	18,11%	16,62%		-1,49
%tage of permanent crops	4,33%	4,38%		0,05
%tage of intensive grassland ²⁾	26,49%	26,89%		0,40
%tage of extensive grassland ²⁾	52,55%	53,68%		1,13

¹⁾ = change of ratio of commuter balance (in-commuters minus out-commuters) in % of employed persons between 1981 and 1991

²⁾ without Italy and Slovenia

Source: own computations

(1) Urban as well as the sub-and peri-urban areas are the centers of growth (sub-trends 1.2, 1.4 and 1.5)

In the last 30 years the Aps are facing a significant polarisation of spatial development: urban centers and strong sub-urban areas in the valley floors (28% of all alpine communities) are the centers of growth: in 1991 57% of the alpine population and more than 70% of all alpine working places and 29% of all touristic beds are concentrated in these booming regions, which represent only 23% of the total alpine area.

These regions still contain 33% of all agricultural businesses, 30% of all cattle and 27% of all agricultural land in the Alps. Agriculture is characterised by a strong decline of population, businesses and agricultural land. In addition there is a shift from full time to part time farming and a significant trend to extensification of agricultural land use.

The influence of spatial development on cultural landscape in strong central areas is characterised by two opposite phenomenons: on one hand there is an increase of various land use interests and conflicts between housing, transport and economic development, leisure areas and agriculture. The corresponding landscape change can be observed on the one hand in larger parcel sizes in the valley floors and on the other hand in the lying fallow of unfavourable parcels. The extensification leads to natural succession towards forest. From various studies we know that intensification as well as extensification both can cause a decline of biodiversity with increasing risks for the ecosystems concerned.

(2) Tourism-dominated areas are the second pole of growth (sub-trends 6.1 and 6.2)

The tourism-dominated areas, located on an average sea level of more than 1.000 m and including ca. 7,5% of the alpine communities are the second pole of growth in the Alps. The tourism-dominated communities represent only 4,6% of the alpine population, but 6,3% of all working places and 39% of all touristic beds. These communities cover about 15% of the total Alpine area. In some aspects the tourism-dominated trend is similar to urban and sub-urban areas in the valley floors: the increase of residential buildings between 1981 and 1991 (33%) is higher than in any other development trend. This is also due to the massive increase of second homes. In the younger past, the numbers of inhabitants, migration and people in productive age are showing a stable, average growth. The commuter balance is positive. In addition, the share of agricultural population is as low as in urban areas.

The tourism-dominated trend is the only backbone of touristic growth in the Alps. Opposite to the general trend in the Alps, touristic beds are still increasing.

The tourism-dominated communities contain 10% of the alpine agricultural land, but only 5,4% of cattle and 5% of all agricultural businesses in the Alps. It seems that there are certain synergies between tourism and agriculture: the decline of agricultural businesses is lower than in other development trends, on the other hand there is a strong shift from full time to part time farming and from intensive to extensive use of grassland, so agriculture seems to be quite stable on an extensified level.

Increasing population and working places, large scale touristic and transport infrastructure as well as increasing land consumption for residential buildings cause heavy pressure on landscape and sensible mountain ecosystems. In the agricultural sector, the two opposite trends can be observed (see REGIONAL CONSULTING 2000): favoured sites are facing intensification, whereas less favoured sites are extensified, often turn to fallow land and forests. This is often combined with a loss of biodiversity and visual quality.

(3) The stagnating balance (Sub-trends 2.1 and 2.2)

The balanced development trend represents about 23% of alpine communities, this trend covers 29% of the alpine area but only 18% of all inhabitants and 12% of all working places. In the younger past these communities can be characterised all in all by a more or less stable development of population and economy, but nearly half of the communities are facing a decline of population and working places. This is a clear indicator for structural problems. Compared to other areas tourism is developing relatively better: opposite to the general alpine trend the number of touristic beds is increasing.

The communities of the balanced development trend include 25% of agricultural land, 32% of cattle and even 43% of all agricultural businesses. This indicates that agriculture still plays a more important role than in other areas. Full time farming is more represented than in other development trends. The decline of agricultural businesses and the shift to part time farming is at average, whereas the tendency towards extensification of agricultural land is lower than in other development trends.

Compared to the strong central areas and the touristic centers, land use conflicts seem to be less intensive. Negative impacts on landscape mainly result from land consumption for housing and from intensive agriculture. Tendencies of urban sprawl are often supported by traditionally scattered settlement structures.

(4) Rural areas 'in between' without specific potentials are facing a remarkable crisis (sub-trends 1.1 and 1.3)

Weak communities in side valleys, on valley slopes and/or communities with bad accessibility and lacking touristic potential, in addition dormitory communities near urban centers are representing about 36% of all alpine communities. They cover 27% of the alpine area but include only 15% of all inhabitants, 16% of all touristic beds and 8% of all working places. These weak areas become more and more dependent on the central regions and their economic welfare. The younger past is characterised by a decline of working places leading to a negative commuter balance and a high rate of out-commuters. Residential buildings are increasing massively. Also tourism is in decline.

In these less favoured areas agriculture is playing a more important role than in other regions: these communities represent 26% of all agricultural businesses, 30% of all cattle and 34% of all agricultural land. In the younger past agricultural land use is characterised by two main aspects: on one hand agricultural land is decreasing stronger than in other areas, on the other hand, the

trend towards extensification is less significant than elsewhere, on the contrary: intensive grassland is increasing in some areas. Later on in the 90ies trends towards extensification can be observed in the countries analysed (France, Slovenia).

Land use conflicts seem to be less intensive than in the strong urban and suburban areas. They arise mainly from land requirements for housing and intensive agriculture.

(5) Sector-dominated development trends (agricultural, industrial or service) do not play an important role (sub-trends 3, 4 and 5)

The communities of the agriculture-, industry- or service-dominated trends all in all do not represent more than 6% of all alpine communities. These communities include 6% of the alpine area, 4% of the alpine population and only 2% of all alpine working places. In the younger past the agriculture-, and industry-dominated communities are facing a massive demographic decline and economic crisis, whereas the service-dominated communities show an average growth. In the agriculture- and the service-dominated trends, tourism seems to be a new, but limited alternative. In these two trends – similar to the tourism-dominated areas – it seems that there is a certain synergy between tourism and agriculture leading to a reduced decline of agricultural businesses and agricultural land. Also the trend towards extensification of agricultural land use is less significant than in other regions.

3. COMPARING GENERAL RESULTS WITH THE RESULTS IN PILOT REGIONS

3.1 Comparison in detail

In the pilot regions the research team tried to verify and to detail the main findings of the analysis on the level of the whole Alps. The detailed results of the pilot region analyses can be found in the 'Regional Reports' (see Literature and REGALP homepage).

In the matrices below the general findings on the level of the whole Alps are compared with the findings in the different pilot regions. For comparing the different pilot regions, table 2 shows the pilot regions' key data:

Tab. 2: Main characteristics of pilot regions

Name, country	No of communities	Surface (km ²)	Inhabitants 1991	Working places 1991	Touristic beds 1991	Agric. pop. % 1991	Agric. businesses 1991	Short characteristics	Sub-trends (% of total communities)	
Wipptal (A)	13	501	14.803 2001: 15.444	3.504	7.042	5,6	783	Commuter-dominated area influenced by the agglomeration of Innsbruck and the Brenner traffic corridor	1.1+1.3 1.2+1.4	69 31
Visp-Saaser Tal (CH)	11	358	13.298 2001: 14.558	8.767	4.137	1,4	648	One of the main touristic centers in the Alps (the Saas Valley) and a regional center (Visp)	1.1 1.2+1.5 6.1+6.2	55 18 27
Le Trièves (F)	29	641	7.209 2001: 7.954	2.218	6.708	16,7	394	Main economical activities are agriculture and tourism. Agriculture is oriented to quality products and biological agriculture. An increasing part of the population finds a job in the Grenoble area but still lives in Trièves	1.1+1.3 1.2+1.4 2.1+2.2 5 6.1+6.2	45 27 7 7 14
Isarwinkel (D)	6	498	18.228 2001: 19.992	5.034	1.724	10,1	776	Service dominated region (tourism!) with important agricultural sector and increasing influence of Bad Tölz and the metropolitan area of Munich (increase of out-commuting)	1.1+1.3 1.2 2.1	67 17 17

Name, country	No of communities	Surface (km ²)	Inhabitants 1991	Working places 1991	Touristic beds 1991	Agric. pop. % 1991	Agric. businesses 1991	Short characteristics	Sub-trends (% age of total communities)	
Carnia (I)	28	1.222	42.709 2001: 40.392	-	4.909	4,1	4.283	Peripheral alpine region with some tradition of economic welfare in the past, very strong roots, but an unavoidable demographic and economic decline. Some pieces of regional industry left, tourism development with little success so far	1.1+1.3 1.2+1.4 2.1+2.2 4 4	29 18 50 4
Piemonte (I)	23	784	50.994 2001: 49.574	-	2.723	2,1	1.165	Peripheral alpine area facing phenomena of demographic and economic crisis and decline. Industry still plays an important role, tourism is concentrated on a few centers	1.1+1.3 1.2+1.4 2.1+2.2 4 6.1	22 35 31 9 4
Upper Sava Valley (Slo)	4	563	42.861 2001: 42.624	-	9.591	3,7	1.362	Jesenice is an old industrial, predominantly urban area with problems of degradation, unemployment, economic restructuring, visually damaged areas etc. Kranjska gora is a service and tourism orientated area, Bled has a strong emphasis in tourism, conflicting interests: development or protection	1.3 1.2+1.5	25 75

Source: own computations

The matrices below compare the findings on the level of the total Alps (1) – (5). In section 6.3 further findings from the pilot regions are grouped to different topics. Based on the general and regional key findings, some hypotheses on further development are summarised in section 6.4. Finally, in section 6.5 the results and hypotheses found in REGALP are compared to other recent research projects, studies and programmes.

(1) Urban as well as the sub-and peri-urban areas are the centers of growth (sub-trends 1.2, 1.4 and 1.5)

Pilot region	Regional findings similar to total Alps	Regional findings opposite to total Alps	Additional remarks
Wipptal (A)	<ul style="list-style-type: none"> • Main growth in the valley floor along the Brenner traffic routes and in the surroundings of Innsbruck • Inner-regional polarisation main valley/side valleys • Land use conflicts and urban sprawl 		<ul style="list-style-type: none"> • No booming center within the region • Because of traffic noise, increase of inhabitants is stronger on the slopes and weak side valleys instead on valley floor
Visp-Saastal (CH)	<ul style="list-style-type: none"> • The strong communities are located in the valley floor • The central region of Visp represents the characteristics of urban areas: intensive economic and demographic growth • Strong decline of agriculture, but increasing share of full time farming • Intensive land use conflicts, on the other hand: extensification of less favoured sites 	<ul style="list-style-type: none"> • Increase of agricultural land 	
Le Trièves (F)	<ul style="list-style-type: none"> • Communities in sub-trend 1.2 and 1.4 show increase of population and working places 		<ul style="list-style-type: none"> • There is no real 'boom region', no bigger local center

Isarwinkel (D)	<ul style="list-style-type: none"> • Region getting more and more dependent on Bad Tölz and the metropolitan area of Munich • Decline of touristic beds in the 80ies, increase in the 90ies • Inner-regional polarisation • Strong growth of residential buildings, increasing land use conflicts in the surroundings of bigger communities • Strong decline of agriculture: population, businesses declining but to a minor extent, decrease of agricultural land 	<ul style="list-style-type: none"> • Shift to extensive grassland lower than in other sub-trends 	<ul style="list-style-type: none"> • Only 1 community belonging to the 1.2 sub-trend • Lenggries is classified 'balanced' (2.1), but has to be considered as the center of the pilot region • Agriculture still plays a relevant role: relatively high %tage of population and full time farming
Carnia (I)	<ul style="list-style-type: none"> • Inner-regional polarisation between the Tolmezzo basin and the fringe mountain valleys • Demographic and economic growth only in Tolmezzo • Urban sprawl and increasing land use conflicts in the surroundings of Tolmezzo • Decline of tourism • Strong shift to part time farming • Decrease of agricultural land and shift from arable land to grassland 	<ul style="list-style-type: none"> • Decline of population even in the 'strong' variant (sub-trend 1.2, 1.4) • Less decline of agricultural population and businesses than in the weak sub-trend 	
Piemonte (I)	<ul style="list-style-type: none"> • The decline in the strong variant is getting lower in the 90ies, partly positive migration • Incease of residential buildings -> land use pressure • Decline of tourism • Low rate and low decrease of 	<ul style="list-style-type: none"> • Decline of inhabitants and economy even in the 'strong variant' • Only partly shift to extensive grassland 	<p>Commuters also to Switzerland (Frontalierato)</p>

	<p>agricultural population</p> <ul style="list-style-type: none"> • Strong decline of agricultural businesses, shift from full time to part time is lower than average, in local centers even shift back from part time to full time 		
Upper Sava Valley (Slo)	<ul style="list-style-type: none"> • Growth of residential buildings and dwellings highly above growth of households, strong pressure on landscape • Low share of agricultural population • Strong decrease of agricultural businesses, partly shift from part time to full time 	<ul style="list-style-type: none"> • Growth of population lower than in the weak variant, negative migration • Touristic growth • Shift from arable land and extensive grassland to cropland and intensive grassland 	Bled is an important touristic center

(2) Tourism-dominated areas are the second pole of growth (sub-trends 6.1 and 6.2)

Pilot region	Regional findings similar to total Alps	Regional findings opposite to total Alps	Additional remarks
Wipptal (A)	<ul style="list-style-type: none"> • Decrease of touristic beds 		<ul style="list-style-type: none"> • Tourism plays an important role in many communities, but there are no touristic centers
Visp-Saastal (CH)	<ul style="list-style-type: none"> • High demographic and economic growth • High increase of settlements -> increasing land use conflicts • Backbone of touristic growth 	<ul style="list-style-type: none"> • 'No more' agricultural population (below 1%) • No stabilisation of agriculture • Remaining farms are full time businesses, parallel intensification and extensification 	<ul style="list-style-type: none"> • The agricultural sector shows trends similar to urban areas in the valley floors: same phenomena, if the bottom is reached?

		<ul style="list-style-type: none"> Increasing agricultural land 	
Le Trièves (F)	<ul style="list-style-type: none"> Tourism-dominated communities are the backbone of growth Synergies between agriculture and tourism, therefore lower decline of agricultural sector Extensification of agricultural land use 	<ul style="list-style-type: none"> Decrease of working places 	<ul style="list-style-type: none"> Soft tourism is dominating Lacking touristic infrastructure
Isarwinkel (D)			<ul style="list-style-type: none"> Tourism plays an important - but not dominant role in many communities
Carnia (I)			<ul style="list-style-type: none"> There are some touristic communities, mainly in sub-trends 2.1 and 1.1
Piemonte (I)	<ul style="list-style-type: none"> Strong increase of residential buildings -> land use pressure Shift from arable land to grassland 	<ul style="list-style-type: none"> Demographic decline, negative migration Decline of touristic beds even in the touristic centers, mainly in the 90ies Share of agricultural population above average, strong decline Decline of agricultural businesses is not below average Shift from part time to full time farming Intensification! 	<ul style="list-style-type: none"> There are only few touristic centers (only 1 community classified under trend 6), in many communities there is no tourism at all

Upper Sava Valley (Slo)			Bled (LZ) is an important touristic center
--------------------------------	--	--	--

(3) The stagnating balance (sub-trends 2.1 and 2.2)

Pilot region	Regional findings similar to total Alps	Regional findings opposite to total Alps	Additional remarks
Wipptal (A)	-	-	-
Visp-Saastal (CH)	-	-	-
Le Trièves (F)	<ul style="list-style-type: none"> • Decline of population, increase of working places • Conservation of agriculture: high %age of agricultural population, increase of agricultural land 		<ul style="list-style-type: none"> • In agriculture, cropland is dominating, not grassland
Isarwinkel (D)			<ul style="list-style-type: none"> • Lenggries is classified 'balanced (2.1), but has to be considered as the center of the pilot region -> see (1)
Carnia (I)	<ul style="list-style-type: none"> • Demographic and economic decline, negative migration • Increase of touristic beds • Agriculture still plays an important role, on the other hand strong decline of businesses • Shift to part time farming lower than in other sub-trends • Partly shift from grassland to arable land 		

Piemonte (I)	<ul style="list-style-type: none"> • Strong demographic and economic decline • Increase of residential buildings -> land use pressure • Share of agricultural population relatively high, low decline • Strong decline of agricultural businesses • Intensification trend (cattle per farm, shift from grassland to arable land) 	<ul style="list-style-type: none"> • Positive migration • Decline of touristic beds • Low decline of agricultural population • Shift from part time to full time farming • Increase of agricultural land 	
Upper Sava Valley (Slo)	-	-	-

(4) Rural areas ‘in between’ without specific potentials are facing a remarkable crisis (sub-trends 1.1 and 1.3)

Pilot region	Regional findings similar to total Alps	Regional findings opposite to total Alps	Additional remarks
Wipptal (A)	<ul style="list-style-type: none"> • The Wipptal is getting more and more dependent on the urban area of Innsbruck • Loss of working places, negative migration in the side valleys • Decline of local services in the side valleys • Lacking touristic potentials • Parallel intensification and extensification (reforestation) in side valleys 		<ul style="list-style-type: none"> • Increase of inhabitants is stronger on the slopes and in the weak side valleys instead on valley floor because of traffic noise

Visp-Saastal (CH)	<ul style="list-style-type: none"> • Demographic and economic decline • High increase of residential buildings • High %tage of agricultural population, but strong decline, decrease of businesses lower than in other sub-trends • Strong shift from full time to part time farming 	<ul style="list-style-type: none"> • Increase of agricultural land • Strong shift to extensive grassland 	
Le Trièves (F)	<ul style="list-style-type: none"> • Decline of working places • Increase of population (migration), trend to dormitory communities • Agriculture still relevant economic sector 	<ul style="list-style-type: none"> • Decline of agricultural population stronger than in strong variant • Extensification is not lower than in other sub-trends 	<ul style="list-style-type: none"> • Increase of commuters and traffic -> pressure on environment and landscape (road construction project) • In agriculture, cropland is dominating, not grassland
Isarwinkel (D)	<ul style="list-style-type: none"> • Decline of working places • Increase of population (migration), trend to dormitory communities • Increase of settlements -> land use pressure • Decrease of touristic beds • High share of agricultural population, but strong decline • High %tage of full time farming, shift to part time farming 	<ul style="list-style-type: none"> • Shift to extensive grassland slightly above average 	<ul style="list-style-type: none"> • Lacking tourism infrastructure

Carnia (I)	<ul style="list-style-type: none"> • Demographic and economic decline, negative migration • Strong decline of agricultural businesses and shift to part time farming • Shift from grassland to arable and cropland -> no extensification 	<ul style="list-style-type: none"> • Decline of inhabitants • Increase of touristic beds • Agriculture plays a less important role 	<ul style="list-style-type: none"> • Tourism is concentrated and increasing in Arta Terme, whereas in the other communities there is nearly no tourism
Piemonte (I)	<ul style="list-style-type: none"> • Demographic and economic decline, negative migration • Increase of residential buildings -> land use pressure • Share of agricultural population higher than in other sub-trends, decline of businesses below average • Shift to part time farming • Shift from arable land to grassland 		
Upper Sava Valley (Slo)	<ul style="list-style-type: none"> • Growth of population, positive migration • Growth of residential buildings and dwellings highly above growth of households • Strong decrease of agricultural businesses • Shift to part time farming • Shift from arable land and extensive grassland to cropland and intensive grassland 	<ul style="list-style-type: none"> • Touristic growth • Low share of agricultural population 	

(5) Sector-dominated development trends (agricultural, industrial or service) do not play an important role (sub-trends 3, 4 and 5)

Pilot region	Regional findings similar to total Alps	Regional findings opposite to total Alps	Additional remarks
Wipptal (A)	-	-	-
Visp-Saastal (CH)	-	-	-
Le Trièves (F)			Service-dominated sub-trend (only 1 community)
Isarwinkel (D)	-	-	-
Carnia (I)			Industry-dominated sub-trend (only 1 community)
Piemonte (I)	<ul style="list-style-type: none"> • Demographic decline • Increase of residential buildings -> land use pressure • Decline of agriculture • Shift to full time farming • Shift from arable land to grassland 	<ul style="list-style-type: none"> • Decline of tourism • Increase of agricultural land 	Industry-dominated sub-trend (2 community)
Upper Sava Valley (Slo)	-	-	-

Source: own computations

3.2 Further key findings in pilot regions

Besides the above results following key findings have been identified in the pilot regions:

Urban sprawl:

- The example of Le Trièves shows that strict regulations help to reduce the phenomenon of urban sprawl (F). Some interview partners stated the same for Isarwinkel (D).
- Population growth and migration surplus promote settlement expansion and splinter development. The favourable living conditions of the Isarwinkel predestine the region as an immigration area not only for elder people, but with regards to transport infrastructure and accessibility also attract people working in neighbouring regions. With the growing demand of extended living space, settlements grow and splinter development is provoked. This trend is encouraged by the already historical scattered settlement structure. Only the restrictive release of building land can be regarded as an inhibiting factor, (D).
- Whereas people were migrating out from fringe areas to the centers in former periods, nowadays they migrate to bigger urban or sub-urban areas. (I, Carnia). In addition, commuting is more and more taking the place of definitive migration.
- Building speculation threatens settlement quality and leads to a degradation of historical, artistic and cultural property (I, Piemonte).
- The growth of settlements and urban sprawl are among the most important negative impacts on landscape (Slo).
- Construction boom of tourist accommodation and housing led to some uncontrolled development of cultural landscape (CH).

Relevance of public policy

- Territorial policies have a strong impact on settlement development, e.g. in Tyrol the restrictive attitude against second homes (in spatial planning and property dealing policies) has limited the number of second homes (A).
- Agricultural land use is strongly influenced by public subsidies to agricultural businesses. In the Wipptal the public subsidies have contributed to stopping the decline of agricultural land, especially extensive grassland, within the last decade (A).
- Successful attempts of maintaining landscapes are often the result of a mix of different measures: for example in the Wipptal there are more alpine pastures cultivated than some years ago. The reasons are agricultural subsidies, subsidies related to nature protection policy and touristic co-operations (guided tours and events on the alpine pastures, farmers selling their products to guests) (A).
- Financial promotion programmes (especially agriculture) stabilise agriculture and diminish the intensification / extensification trend respectively cultural landscape change. Above all, the Bavarian Cultural Landscape Programme (KULAP), the Nature Protection Contractual

Programme (VNP) and compensation payments (Ausgleichszulage, Erschwernisausgleich) are an important economic basis for local farmers and contribute effectively to the maintenance of agriculture adapted more or less to the natural conditions. Therefore major agricultural landscape changes are avoided. But even the sum of tourism profits and agricultural promotion programmes cannot prevent slight agricultural and landscape changes (D).

- On the contrary, the relevance of regional planning law and the linked instruments (regional plans) are considered as very low – regional plans are estimated as more or less without impact on regional structures and landscape (D).

Transport and accessibility

- The concentration of food trade near main roads leads to a lack of food supply in small villages. Concentration trends can also be observed in gastronomy and public services (e.g. post office) (A).
- For rural regions with a weak economical and touristic potential the high-ranking transport infrastructure may be considered as an instrument to increase dependencies: The highway allows to move out quicker (out-commuters) or to pass quicker through the region (tourists) (A).
- A good transport infrastructure and the population's motorisation have allowed to change out-migration regions into out-commuting regions, because local centers can now be reached within the daily commuting distance (A). The same can be stated for D.
- The maintenance of the network of small (agricultural) roads (Güterwege) is very important for keeping up the cultivation of remote agricultural businesses; small roads and trails are also a precondition for leisure activities and tourism (A).
- The decline of primary and secondary sector promotes out-migration and finally the development or improvement of transportation infrastructure (mainly roads, but also rail). Such a development in the end again leads to higher accessibility and further promotion of out-migrating with the corresponding impacts on the economic structure as well as landscape and environment. But on the other hand, higher accessibility also creates more favourable conditions for tourism (D).
- In some regions, increasing land slides and other natural risks reduce accessibility (I, Pi).
- A new alpine railroad connection through the Lötschberg Tunnel (NEAT) will enhance accessibility of the region and therefore attract additional freight traffic (CH).

Commuting

- The increase of inhabitants in weak areas can be caused by different factors: in-migration, out-commuting, secondary homes transferred to permanent homes by retired persons and others. The tendency to dormitory communities is often linked with the trend to secondary housing. (F)

- Commuting can contribute to stability: commuter communities are often more stable than balanced communities, where the negative demographic trends are often more significant (I, Ca).

Tourism

- Tourism business needs attractive landscape, but just landscape is not enough: landscape must be usable for leisure activities, this requires infrastructure (A, D).
- On the other hand agriculture plays an important role for preserving landscape (CH)
- In weak peripheral areas there is often a lack of touristic knowhow (I, Pi).

Agriculture

- The economical development of Alpine agriculture depends at one hand on the market (above all demand for milk and bovine cattle), at the other hand on agricultural policies. For the Wipptal the interdependence of the structural change of agriculture with touristic development cannot be observed. The hypothesis that tourism stabilises agriculture (see results of Germany) cannot be verified. In the Wipptal the shift from full-time to part-time agriculture is very strong, but quite different in the municipalities. An evident interrelation with tourism development, commuter ratio or with agricultural land use is not noticeable (A).
- Stable development of the agricultural sector is dependent on different aspects: ecological agriculture as a market alternative, direkt marketing to near urban regions, combination with soft tourism (F).
- Tourism stabilises agriculture respectively diminishes the agricultural restructuring and therefore contributes significantly to landscape conservation. The majority of local farmers also profit from the touristic added value, so that a breakdown of agriculture is being held off. Of course, this kind of profit is not as obvious as the subsidies from agriculture promotion programmes, but the linkage is stated by local stakeholders (D, CH).
- Economic conditions becoming worse and worse may lead towards the increase of full time agricultural businesses. There are some concrete cases in the Isarwinkel in which workers who formerly were occupied in small-scale industry returned to full time agriculture after the closure of the firms (D).
- Agriculture is more stable in th balanced than in the weak communities (I, Ca).
- Entrepreneur mentality is lacking, therefore farmers are not open for agrotourism, agriculture is only for survival (I, Pi).
- Part time farming is often done by women, often it is done more by affection than for economic reasons (I, Pi).
- The decrease of agricultural population as well as the decline of agricultural businesses lead to greening of arable land nad growth of forests. This is often combined with a loss of biodiversity and visual quality (Slo).

- The production aspects of agriculture are not of great importance as it is mainly to maintain landscapes for tourism (CH).

Regional identity

- Social life is a strong factor of regional identity: In spite of the growing importance of out-commuting the Wipptal population does not consider their villages as dormitory communities, because there is a manifold social life (education, care, leisure and culture associations,..) (A, D). Similar results can be stated for Germany.
- Conservative values and emotional bindings to the region may contribute to landscape preservation: e.g. part time farmers continue mowing meadows even if there is no economical interest in doing so (A). The same can be stated in D (e.g. farms having only a few bovine cattle).
- The strong “homeland” attitude of locals prevents excessive agricultural restructuring and major landscape changes. The emotional binding of the Isarwinkel inhabitants is connected with strongly conservative values regarding agriculture, nature, landscape and tradition. These attitude has to be regarded as a strong factor for maintenance of agriculture and nature and landscape conservation – even if it isn’t comprehensible from the economic point of view (D).
- Co-operation between municipalities is lacking, competition and individualism are dominant (I, Pi).

4. HYPOTHESES ON FURTHER DEVELOPMENT

Based on the results on the level of the Alps as a whole and of the pilot regions, following hypotheses for further development can be stated:

(1) Polarisation will continue

- Economic growth and welfare will be more and more dependent on central areas representing ca. 1/3 of all alpine communities. This polarisation is far away from being ‘sustainable’.
- In tourism-dominated areas we can expect stagnation on high level or a slight increase in the highly specified and strong touristic centers representing 6-7% of all alpine communities. Instead of quantitative increase, strategies will focus on raising quality. Less favoured touristic areas on lower sea level and with less economic power will lose accessibility results.
- The balanced development trend representing 23% of all communities in 1991 will decrease more and more. Some of the communities will be able to develop and improve their potentials (towards sub-trends 1.2 or 6.2), whereas at least half of these communities will face an economic and demographic decline (towards sub-trend 1.3).

- The areas 'inbetween', the rural areas with lacking own potentials risk to get deeper into crisis. Together with the former balanced communities they will represent at least 50% of all alpine communities!

(2) Increasing land use conflicts versus extensification

- Continuing urban sprawl is one of the main problems for landscape development. Demographic factors will lead to increasing number of households and to further land use requirements for housing. The central areas and the touristic centers as well as regions with attractive landscapes near urban areas are concerned most, but this phenomenon can be stated in nearly all areas.
- Especially in urban areas land use conflicts will increase. This will be the main challenge for land use planning.
- Besides intensification in specific favoured areas, agriculture will be reduced and extensified on a grand scale, in some areas agriculture will totally break down.

(3) Traffic growth

- The further improvements of accessibility because of road construction will cause increasing traffic volume and commuter rates. Negative environmental impacts (noise, pollution) will increase.
- Increasing accessibility will intensify the interrelation between inner-alpine areas and metropolitan areas outside the Alps. Thus the external influence especially on alpine border regions will increase.

(4) Agriculture: concentration versus extensification

- In tourism-dominated areas synergies between agriculture and tourism will help to stabilize agricultural land use on an extensive level. As landscape is a key resource, tourism will support maintainance of landscape.
- The structural change in agriculture will continue: a general decline of agricultural population, land, and businesses as well as a shift from full time to part time farming combined with greening of arable land and a shift from intensive to extensive grassland. In the same time, the number of cattle per farm increases. When 'the bottom' is reached (minimal rate of agricultural population, little number of businesses left), there will be a shift back from part time to full time farming and partly from extensive to intensive grassland and to arable or cropland on the favoured sites. This is true not only for agriculture in sub- and peri-urban areas, but also in high developed touristic areas, as the Swiss pilot region shows.
- There seem to be 3 alternatives in agriculture: (1) widespread giving up, (2) widespread part time farming on an extensive level as well as (3) full time farming on a limited scale. The new trend back to full time farming should not be overestimated!

5. COMPARING RESULTS AND HYPOTHESES WITH OTHER CURRENT RESEARCH WORK

BÄTZING, W. (2002): 'Die aktuellen Veränderungen von Umwelt, Wirtschaft, Gesellschaft und Bevölkerung in den Alpen' – The current changes of environment, economy and society in the Alps

In his study 'Die aktuellen Veränderungen von Umwelt, Wirtschaft, Gesellschaft und Bevölkerung in den Alpen', BÄTZING points out, that the polarisation trend, already starting in the 50ies, has been accelerated since the 70ies due to infrastructure extension (p.8). In addition, especially the trend to dormitory communities in the alpine border areas is massively influenced by the big metropolitan areas near the Alps, like Vienna, Munich, Zürich, Lyon, Milano and Torino.

BÄTZING's research works also confirm the polarisation trend in the agricultural sector between intensification of favoured sites and extensification of less favoured areas. This leads to problems like increasing pressure on environment, a decline of biodiversity and increasing risks of natural hazards. All in all, this development processes cannot be regarded as 'sustainable' (p.20).

Also regarding tourism, BÄTZING's research work comes to similar results as the REGALP team: tourism is stagnating as a whole, only the strong touristic centers can improve, the less favoured touristic areas on lower sea level or with less capital are not competitive any more.

Finally BÄTZING points out that further alpine development strategies have to be based on specific different types of regional development, if policies and instruments aim at improving the situation towards sustainability (p.23). Special attention should be given to rural areas, because here economic, ecological and social problems will increase. Following BÄTZING, the European Spatial Development Plan does not take this into account sufficiently, because it mainly aims at strengthening the urban areas (BÄTZING 1998).

BÄTZING, W., DICKHÖRNER, Y. (2002): 'Die Typisierung der Alpengemeinden nach 'Entwicklungsverlaufsklassen' für den Zeitraum 1870-1990' – The typology of alpine communities based on the development of inhabitants between 1870-1990

The authors point out, that it is necessary to work on community level, if specific development trends in the Alps have to be analysed (p. 275), the NUTS 3 level is too general. In the whole period between 1870 and 1990 the growth of inhabitants in the Alps is below European average. In addition, there are two different poles: in the south-western and south-eastern parts of the Alps there is a decline of population, whereas inhabitants are increasing in the western part of the Eastern Alps. 1970 is a breaking point: before, the Alps can be characterised as less favoured area in Europe, after 1970 this has changed. Nevertheless inner-alpine disparities between strong urban areas and depopulating peripheries are continuing and tourism is stagnating. Whereas different regional development trends have been visible on macro level in the 1950ies, they have been appearing more and more as a small scale mosaic since the 1980ies.

The different community types identified by the authors in a cluster analysis show different results in the different countries. This makes clear that the national framework is very much influencing local and regional development trends, although this influence has been diminishing since the 1970ies and will continue to diminish with the further integration of the European Union. The community types have been correlated with some indicators like sea level and community size and inhabitants. The results are corresponding very much to the findings of REGALP: the 'positive' clusters are mainly in the valley floors and on lower sea level, they are smaller and have more inhabitants, the 'negative' clusters are on higher sea level, they are larger and have less inhabitants. This is clearly indicating sub- and peri-urbanisation processes. The only positive cluster on high altitude is tourism-dominated.

PERLIK, M. (2001): 'Alpenstädte zwischen Metropolisation und neuer Eigenständigkeit' – Alpine Centers between metropolisation and new self-reliance

In his study PERLIK tried to verify some hypotheses concerning the development of urban regions in the Alps: the expansion of urban areas and their influence on rural areas, the role of smaller towns in Post-Fordism, the influence of metropolitan areas outside the Alps like Milano, Vienna, Munich etc. on alpine border regions, the future double function of towns (local/regional supply and European/global network function (p. 196). He classified existing urban areas into 4 different types:

- UT1: functional urban area of European relevance
- UT2: functional urban area of national relevance
- UT3: functional urban area of regional relevance
- UT4: singular functional urban area

In addition, he described the different types and areas with regard to the development of the different economic sectors.

All REGALP pilot regions (or parts of them) belong to urbanized areas classified by Perlik:

- Isarwinkel (D) is part of the metropolitan area of Munich (UT1)
- Wipptal (A) is part of the metropolitan area of Innsbruck and the northern parts of Le Trièves in France is part of the metropolitan area of Grenoble (both UT2)
- Parts of the Swiss (Visp), the Italian (Domodossola in Piemonte and Tolmezzo in Carnia) and the Slovenian (Bled) pilot regions belong to type UT4.

Following PERLIK these urbanised zones can be characterised by following phenomenons:

- Strong decline of industry and mining, shift to the service sector
- Stagnation or only slight increase of working places in the transport and communication sector

- Retail sector is growing at average (+8% growth of working places between 1981 and 1991), the growth of wholesale is only slightly higher
- Personal and touristic services increase slightly above average, whereas commercial services (+56%) and public services (+24%) show the highest increase.

In the different alpine states, following aspects regarding the different economic branches are important: the energy and mining sector is breaking down in Slovenia, the strongest decline of industry can be observed in Austria and Italy. Personal and touristic services show a strong increase mainly in France and Austria, but less in Switzerland and Italy.

The most important findings of Perlik's research work can be summarised as follows:

The large scale changes of spatial structures are influencing very much the urbanized areas in Europe, also in the Alps. As a result of globalisation urbanised areas tend more and more to highly specialised network functions, whereas the supply of the surrounding regions is taking a back seat more and more. Competition between urbanized regions between inside and outside the Alps as well as among the inner-alpine urbanized regions is increasing. In this competition, the big European metropolitan areas like Milano, Munich, Vienna etc. are in advantage, because they are more attractive for key branches like the financial sector. Inner alpine urban areas are always lagging behind. These metropolitan areas close to the Alps are influencing the alpine border regions very much, as it has also been shown by other authors. The inner-alpine structure of urbanized areas did not change very much in the younger past. This is due to geomorphological, political and economic reasons.

The results of Perlik fit quite well to the findings of REGALP, where the importance and the influence of urbanized areas as well as the decline of the industrial sector have clearly been emphasised.

BÄTZING, W., PERLIK M. (1999): die Zukunft der Alpenstädte in Europa – the future of alpine towns in Europe

In the synthesis of the Conference in Villach 1999 BÄTZING points out, that the influence of Alpine cities decreased rapidly in the 19th century with the constitution of European national states with the frontiers on mountain ridges. Traditional economic networks were destroyed and inner-alpine cities lost importance. Industrialisation contributed to the gap between inner alpine towns and European metropolitan areas, because of lacking accessibility, size and political influence. Industrial development therefore took place later and in an understated extension. Besides some centers of industrialisation (like the Mur-Mürz Valley in Styria, Austria) big parts of the Alps were re-agriculturalised. The peak of industrialisation was in the end of the 70ies, where the second sector played a dominant role in the Alps. This development is not only typical for the Alps, but also for other rural areas in Europe.

The shift to the tertiary sector in the 80ies had different consequences:

- Specialisation of big metropolitan areas in a more and more competitive and international market
- Middle-sized urban areas are facing a loss of influence and are forced to specialisation, too
- Suburbanisation in large, middle-sized urban areas and small towns because of mass-motorisation.

The Alps do not have competitive urban areas bigger than 1 Mio. inhabitants. The largest urban areas are (p.5): Grenoble (500.000), Annecy (400.000), Bregenz and Rhein Valley in Vorarlberg (280.000), Innsbruck (275.000), Lugano (265.000), Trento (260.000).

The topographic preconditions are leading to specific problems in alpine towns: limited space and high prices for land, environmental problems because of inversion (basins) and suburbanisation along the traffic corridors.

Besides urbanised regions, a structural change can also be observed in rural areas: the decline of industry, a stagnation of tourism and the breakdown of peripheral regions. The mono-functionalisation and specialisation is leading to increasing environmental problems also in rural areas.

BÄTZING, W. (2000): Die Alpen als Vorreiter und Prüfstein einer nachhaltigen Regionalentwicklung im Zeitalter der Globalisierung – The Alps as a precursor and touchstone for sustainable regional development in the era of globalisation

The author points out, that it is necessary to analyse spatial development on local level. This is the only way to identify development problems like decline of population or working places. Working on Nuts 3 level, as the European Commission mostly does, produces wrong pictures: the whole alpine region would be classified as booming area – which is not true.

Polarisation is one of the key characteristics: there are 4 main types of development: (1) metropolitan areas, (2) dormitory regions near metropolitan areas situated outside the Alps, (3) rural areas with touristic or other (or no) economic focus and finally (4) depopulated areas (see p.8f).

Among the metropolitan areas in the Alps there are only 7 with more than 150.000 inhabitants (Grenoble, Innsbruck, Luzern, Annecy, Maribor, Klagenfurt, Trento). These are only regional metropolitan, in the global or european context they do not play a relevant role (p.2). Sub- and peri-urbanisation can also be found along the traffic corridors, the most important are: Brenner, Gotthard, Mt. Blanc, Mt. Cenis and the Tauern corridor (p.3).

The influence of external metropolitan areas is increasing: in the Lombardia, the Vienna and the Munich urban areas the alpine borders become more and more dormitory regions. Increasing polarisation leads to increasing traffic and to pressure on environment and landscape.

Tourism plays a less important role than it is generally estimated. Only in the western part of the Eastern Alps (Vorarlberg, Tirol, Salzburg, Carinthia, Southern Tyrol) tourism is of area-wide importance (p.4). The stagnation of tourism leads to enhanced competition, where the weak

areas will be the losers. The stagnation also leads to increasing demand for further touristic infrastructure and development.

Agriculture is facing a massive decline, there are only a few areas in Austria and Bavaria, which are developing better. In many other alpine areas agricultural businesses are very small, succession is unclear and traditional structures of production have broken down.

All in all, the findings of the author are corresponding very much to the findings of REGALP. The classification of development types is slightly different.

REGIONAL CONSULTING (2000): Kultur – Landschaft – Entwicklung im westösterreichischen Alpenraum. Teilmodul Raumstruktur und Regionalwirtschaft – Culture – Landscape – Development in the Western Austrian Alps. Sub-project spatial structures and regional economy

This research project aimed at analysing the inter-relation between the change of spatial structures and cultural landscape in the Austrian provinces Vorarlberg, Tyrol and Salzburg. The methodology was similar to REGALP, RC used the same BÄTZING community types and similar cultural landscape indicators. The research period was 1971-1991. There was a case study in 'Bregenzerwald', Vorarlberg. The main findings correspond directly to the findings of REGALP (see Tab. 3).

REGIONAL CONSULTING, BIOTECHNICAL FACULTY OF THE UNIVERSITY OF LJUBLJANA; UPIRS, E.C.O. (2001): Sustainable development of alpine cultural landscapes in the Austria - Slovenia border region

This cross-border research project aimed at analysing the inter-relation between the change of spatial structures and cultural landscape in the South-Eastern Alps. The methodology was similar to REGALP, the research team used the same BÄTZING community types and similar cultural landscape indicators. The research period was 1971-1991. There were two pilot regions, one in Carinthia (St. Michael ob Bleiburg) and one in Slovenia (Črna na Koroškem). Besides regional development, research was focussed on accessibility and ecological impacts. The main findings correspond directly to the findings of REGALP (see Tab. 3).

Tab. 3: Comparison between main sub-trends in the Western Asutrian Alps, the Alps on the Austria-Slovenian border region and the total Alps 1971 – 1991

Trend	Sub-trend	Western Austrian Alps %	Alps on A/Slo border %		Total Alps %
			A	Slo	
1. Centrally dominated development	1.1 Transition to commuter-dominated development, weak variant	18,2	21,9	2,6	24,4
	1.2 Transition to commuter-dominated development, strong variant	9,9	14,8	-	16,1
	1.3 Commuter dominated-development, weak variant	20,4	30,5	20,5	14,4
	1.4 Commuter dominated-development, strong variant	13,5	11,8	-	9,0
	1.5 Local centers	5,4	7,2	23,0	7,0
2. Balanced development	2.1 Balanced development	9,4	8,6	15,4	13,7
	2.2 Transition to balanced development	-	-	25,6	5,0
3. Agriculture-dominated development		-	-	-	0,6
4. Industry-dominated development		-	-	10,2	0,6
5. Service-dominated development		-	1,6	2,6	3,0
6. Tourism-dominated development	6.1 Tourism-dominated development	3,6	1,7	-	2,4
	6.2 Transition to tourism-dominated development	7,5	2,3	-	4,0
Small communities		4,9			
TOTAL number		499	128	39	2.370

Source: own computations

The comparison between the two different regions and the total Alps shows clearly, that the structural change and functional specialisation have already advanced further in the Western Austrian Alps (sub-trends 1.3 and 1.4 are higher, 1.1. and 1.2. are lower than Alpine average). In addition, tourism is more dominant, whereas balanced and non-specialised development is less important.

In the Austria-Slovenia border region tourism does not play an important role, on the Slovenian side there is not even one tourism-dominated community. On the other hand, industry is very important – due to the specific situation in Slovenia, where the alpine valleys were facing a massive industrialisation in the past. The high rate of sub-trend 2.2 is mainly due to high losses of working places. The missing of sub-trends 1.2 and 1.4 clearly indicate the lacking of own economic potentials in the Slovenian research area ‘Koroška’.

As far as the interrelation between regional development trends and cultural landscape indicators are concerned, observations similar to those of REGALP have been made in both research projects: increasing polarisation, intensification of favoured areas and sites as well as extensification of less favoured areas on macro as well as on micro level.

SUSTALP (2000): Evaluation of Instruments of the European Union regarding their Contribution to Sustainable Environment and Agriculture in the Alps, Final Report

The SUSTALP project aimed at analysing the environmental impacts of agro-political measures and at deriving from that analysis the consequences necessary to give a strategic direction to agricultural policy. The two main hypotheses were:

- There are only indirect impacts from agricultural policy to environment, the causal link is represented by the farm managers and their strategies
- The strategies of farm managers do not only depend on agriculture policy alone, but also on the regional and operational settings.

In SUSTALP the research team developed 8 different regional types, which are strongly related to the different countries. Therefore it is quite difficult to find parallels between the SUSTALP types and the REGALP development trends:

SUSTALP Region type 1 can be found between Verona and Meran in Italy as well as along the mediterranean coast and partly in the south western alpine border region. It is characterised by labour-intensive cropland in favoured sites with a small scale and highly specialised farm structure and a low percentage of closures. In these regions mainly REGALP sub-trends 1.1., 1.3, 2.1 and also 1.5. are dominant. These sub-trends correspond to the SUSTALP type, because they are characterised by persisting agriculture and a lower tendency to extensification than in other sub-trends.

SUSTALP Region type 2 can be found in the south-eastern border regions of the Alps in Slovenia, and also in the south-western border regions in France. This type is characterised by labour-extensive arable land in favoured sites. There is a high decrease of part time farming and an increase of inhabitants. The corresponding REGALP sub-trends are again 1.1 1.3, and 1.5 as well as partly 3, 6.1 and 6.2. There seems to be no direct link between both classifications.

SUSTALP Region type 3 is dominant in the Eastern Austrian Alps as well as in Southern Tyrol. It is characterised by grassland with tourism integration and balanced population movement, specialisation in stock farming, low number of closures, but a strong shift from full time to part time farming. The main REGALP sub-trends are 1.1., 1.3, 2.1 and 6 in Southern Tyrol.

SUSTALP Region type 4 can be found in the South Alpine peripheral regions in Italy. It can be described as small scale grassland farms in favourable sites with a surplus of labourers. There is an extremely high percentage of very small farms (< 5ha), an increase of over-aged farm managers and a fast growing percentage of abandoned land. The economic situation is very prob-

lematic. The main REGALP sub-trends in these areas are 1.1, 1.3, 2 and 4, where demographic and economic decline and other structural problems are evident.

SUSTALP Region type 5 can be found in the inner parts of the Italian Alps as well as in Eastern Tyrol. It is an agricultural retraction area with remains of cultivation. Natural conditions are hard: steep slopes and a high percentage of unuseable agricultural land. Farm structures are very small, the owners are old, there is a high percentage of closures. In these areas agriculture is collapsing. The main REGALP development sub-trends in these areas are 1.3 and 2 where agriculture is still a relevant economic sector.

SUSTALP Region type 6 can be found in Eastern Switzerland and in the Eastern parts of the French Alps. It is characterised by structured, full-time farming with a tendency towards extensification. The number of closures is quite high (mainly part time farms) combined with a reversion of uncultivated land back to agricultural use. There is a focus on full time farms with a high mobility of land between these farms, part time farming is in decline due to Swiss agro-policy. The main REGALP sub-trends are 5 and 6 (service- and tourism-dominated). This seems to correspond quite well.

SUSTALP Region type 7 is the alpine 'standard region' on the way to part time farming. It can be found in Western Austria, Germany, Western Switzerland and adjacent to Geneva. It is characterised by a high %tage of intensive grassland and a high employment rate. The touristic intensity is quite high. The number of farm closures is moderate. The main REGALP sub-trends are 1.3, 1.5 and 6.

SUSTALP Region type 8 can be found in the north of Switzerland. It is characterised by large-scale cattle breeding in morphologically favourable locations. There is high employment in agriculture, a low %tage of part time farming, large farms with young managers, labour-extensive but material-intensive, most farms are specialised in pasture-farming. This type shows the highest specialiation among of all. The corresponding REGALP sub-trend is 2 (balanced), where agriculture is still more important than in other sub-trends. This seems to fit well.

Tab. 4: Comparison between SUSTALP regional types and the main REGALP development sub-trends

SUSTALP Regional types	Main REGALP development sub-trends									
	1.1	1.2	1.3	1.4	1.5	2	3	4	5	6
Regional type 1										
Regional type 2										
Regional type 3										
Regional type 4										
Regional type 5										
Regional type 6										
Regional type 7										
Regional type 8										

Source: own computations

REGALP sub-trends 1.3 and 2 are in correspondence with nearly all SUSTALP regional types. The tourism-dominated trend (6) is corresponding to the SUSTALP regional types 3, 6 and 7. This underlines the phenomenons of coexistence between agriculture and tourism: high rate of part time farming and extensive land use, but a certain stabilisation. In some cases a shift back to full time farming and a reversion of uncultivated land back to agricultural use can be observed (pilot region Saastal, SUSTALP regional type 6).

On the other hand, the most problematic SUSTALP regional types 4 and 5 are related most to REGALP sub-trends 1.3 and 2, the weak commuter-dominated and the stagnating balanced sub-trend. So from both points of view, remarkable phenomenons of crisis can be observed. These sub-trends are also dominating SUSTALP regional type 3, which is in a slightly better situation.

All in all the comparison between the classifications of SUSTALP and REGALP shows that some of the types are corresponding directly, whereas the more widespread types like sub-trend 1.3 and 2 or regional type 7 correspond to more types respectively sub-trends. It seems that the SUSTALP results are quite helpful to better understand the REGALP sub-trends.

BÄTZING 1996 (Editor): 'Landwirtschaft im Alpenraum – unverzichtbar, aber zukunftslos' – Agriculture in the Alps – indispensable, but without a future?

A comparison between the development of agriculture in the different alpine countries shows, that there are a lot of similarities, but also various differences. The comparison was based on the following indicators: the number of agricultural businesses, the number of cattle and the number of sheep. The author points out that the comparison of agricultural data between the different countries is quite difficult and should be made very carefully. Agricultural land is not directly comparable, because forests and alpine pastures are treated differently in each single country. In

addition, when using the indicator 'cattle per farm' one has to take into account, that the number of farms without animals is quite high in France (ca. 30%), but much lower in the other alpine countries (ca. 10%). The number of sheep is quite high in France, Italy and Switzerland, but low in the other countries. Therefore Switzerland is estimated as the country with the highest density of animals per agricultural surface in the Alps.

The findings based on agricultural data for different countries should generally be used for qualitative interpretations and not too much for quantitative analyses.

The authors estimate the number of agricultural businesses in official statistics as too high, because each single agricultural activity and also hobby farming are included. BÄTZING proposes to reduce the number of farms in the total Alps from the official number of ca. 500.000 in statistics to not more than 450.000. Bätzing gives following key data for agriculture in the Alps in 1991:

Tab. 5: Key data of agriculture in the Alps

Indicator	Bätzing 1996	REGALP
Inhabitants	10,600.000	11,700.000
Surface of agricultural land (officially)	184.000 km ²	184.800 km ²
(including corrections)	191.000 km ²	
Agricultural businesses (officially)	514.000	503.000
(including corrections)	452.000	
Full time farms in %	35%	
No. of cattle	4.005.000	3.454.000
Cattle per farm	9	17
No. of sheep	1,514.000	-

Source: BÄTZING 1996, own computations

These key data correspond quite well to the REGALP data. The difference in cattle per farm is due to the fact that in REGALP the calculation basis are only the farms with cattle and not the total number of farms.

Following the authors, agriculture in the Alps can be generally divided into two main types: the roman type and the german type (the slavic type is quite similar to the german):

Tab. 6: Comparison between the two main types of agriculture in the Alps

Indicators	Roman type	German type
Geographical extension	Western and Southern Alps	Northern and Eastern Alps
Climate	Warm, dry	Cool, humid
Right of succession	More successors	Only one successor
Parcelling	Small pieces of land	Large pieces of land
Size of farms	Smaller	Bigger
Agricultural land use	Greenland, but also arable land, cropland, vineyards	Dominating greenland
Cultural aspects	Collectivism, less open for innovation	Individualism, open for innovation
Political aspects	Central governmental structures	Federal governmental structures

Source: BÄTZING 1996, own computations

The structural differences between these two types lead to clear advantages for the German type. This is clearly underlined by the development of agriculture in the younger past: in the Western and Southern Alps the breakdown of agriculture has taken place already in many regions, whereas the situation is better in the Eastern Alps like in Bavaria or the Western parts of Austria. But even there, structural problems are obvious and breakdown will follow, if the trends do not change.

For the future, BÄTZING shows three alternatives:

- (1) purely market-oriented and highly specialised businesses
- (2) Self-sufficiency strategy
- (3) multifunctional strategy.

It seems to be clear that strategy (1) is an option for only very few businesses in favoured areas, whereas strategy (2) is completely unrealistic. Therefore strategy (3), a multifunctional orientation of alpine agriculture should be the heart of future policy and instrumentation.

EUROPEAN COMMISSION (2001): Community-Initiative INTERREG III B Alpine Space Programme

In the first part of the planning document of the INTERREG III B Alpine Space Programme the programming area (alpine core area, alpine foothills and surroundings) are described in general. The different chapters are focussing on characteristics of spatial development, the different economic sectors, transport, environment, the different fields of EU policy (structural funds, LEADER, Environmental programmes etc).

The key characteristics correspond totally to the main results shown by the studies mentioned above: increasing disparities between prospering urban and declining rural areas, concentration process in the touristic sector, polarisation in agricultural land use with intensification of favoured sites and falling shallow and reforestation of less favoured sites. The document also states increasing environmental problems due to land consumption for settlements, transport and touristic infrastructure, noise and air pollution along the traffic corridors, pollution of soil and water as a result of agricultural and industrial production, mainly concentrated in valleys and basins, but also in touristic centers on high altitude.

In addition, the document goes more into detail regarding traffic development: whereas in 1965 87% of the traffic freight between Northern Europe and Italy via the alpine core area were transported by rail and only 13% by car, this changed to 45% (road) and 55% (rail) in 1998 (p.31). Today 62% of freight transport via the Austrian passes are hauled by lorries, in France it is about 83%, whereas in Switzerland 75% of freight traffic is transported by rail. In the 19th and 20th century the alpine valleys were mainly linked to centers outside the Alps, whereas links between inner alpine cities are still lagging behind. Furthermore, lacking accessibility is a key problem for many inner-alpine side valleys. The study HORIZON 2010, done for the European Commission by a consortium including REGIONAL CONSULTING, forecasts a growth of freight traffic by 75% and by 36% of passenger traffic between 1992 and 2010 (p.33).

EUROPEAN COMMISSION (1999): European Spatial Development Plan (ESDP). Towards Balanced and Sustainable Development of the Territory of the EU.

In the ESDP several phenomenons of spatial development of urban and rural development in Europe are summarized. The general trends stated correspond mostly to the findings of REGALP. This is another indicator, that the development trends in the Alps are similar to those of other European regions: increasing disparities between urbanised and rural areas, which become more and more dependent of 'outside' areas, environmental problems in the main traffic corridors and in the main basins as well as in the touristic centers, the polarisation in agriculture with intensification of favoured areas and a decline in less favoured sites etc. All in all cultural landscape is estimated on one hand as a big potential for European regions, on the other hand it is endangered because of the above trends. The main differences between the Alps and other European regions are caused by the specific topographic situation, which is a strongly limiting factor (limited land, climatic situation, accessibility etc).

ÖSTERREICHISCHES BUNDESKANZLERAMT (1997): Regionalentwicklung im Alpenraum. Vorschläge für die Behandlung des Alpenraumes im Rahmen der europäischen Raumentwicklungspolitik – Austrian Federal Chancellery: Regional Development in the Alps. Proposals how to deal with the Alps in European development policies

The authors were describing recent development in the Alps, mainly based on previous works of BÄTZING, MESSERLI, PERLIK and other authors. The investigations are focussing on the Austrian Alps. They point out that the Alps are characterised by big small- and medium-scale disparities. Spatial and economic development in the Alps are similar to other rural areas in Europe. The industrial sector is often underestimated and still plays an important role until the 80ies.

The authors also focus on the fact that consumption of land in sensitive areas with limited space is one of the crucial problems for further development in the Alps (p.17).

The reduced accessibility of many alpine regions is one reason for limited markets and reduced economic options compared with regions outside the Alps. This leads to significant disadvantages for peripheral alpine regions.

The situation of agriculture is characterised by a change from full time to part time farming and by big succession problems. Instead of innovation only an adaption of structures can be observed. The authors also confirm the process of concentration in the touristic sector.

The main results of this investigations underline the central REGALP findings, although they are mainly concentrating on the Austrian part of the Alps.

Summarising the different recent research works we can say that the main findings of REGALP generally correspond to the central results and findings of the studies and research projects mentioned above. REGALP provides additional and new information regarding different spatial development trends in the younger past and the interrelation to cultural landscape change on community level, which has not yet been done in other research works and documents analysed. In addition, REGALP also provides additional and new information about accessibility and its influence on regional development and cultural landscape change for the whole area of the Alps, (see Annex 3 to Work package 2 report), which has not been elaborated before.

6. LITERATURE

BÄTZING, W. (2002): Die aktuellen Veränderungen von Umwelt, Wirtschaft, Gesellschaft und Bevölkerung in den Alpen, im Auftrag des Umweltbundesamtes Berlin. Berlin.

BÄTZING, W. (2000): Die Alpen als Vorreiter und Prüfstein einer nachhaltigen Regionalentwicklung im Zeitalter der Globalisierung. Alpenkonferenz 'Nachhaltige Entwicklung im Alpenraum' am 30.6.2000. München.

BÄTZING, W. (1998): Die Alpen im Spannungsfeld der europäischen Raumordnungspolitik. Einführungsreferat zum Expertenseminar 'die aktuelle Situation im Alpenraum und das Projekt REGIONALP (EFRE Art. X). Salzburg.

BÄTZING, W., DICKHÖRNER, Y. (2001): Die Typisierung der Alpengemeinden nach 'Entwicklungsverlaufsklassen' für den Zeitraum 1870-1990. In: Mitteilungen der Fränkischen Geografischen Gesellschaft.

BÄTZING, W. (Schriftleitung) (1996): Landwirtschaft im Alpenraum – unverzichtbar aber zukunftslos? Europäische Akademie Bozen, Fachbereich Alpine Umwelt. Wien.

BÄTZING, W., MESSERLI, P., PERLIK, M. (1995): Regionale Entwicklungstypen. Analyse und Gliederung des schweizerischen Berggebietes. Bern.

EUROPEAN COMMISSION (2001): Community-Initiative INTERREG III B Alpine Space Programme. Programme Document. Brussels

EUROPEAN COMMISSION (1999): European Spatial Development Plan (ESDP). Towards Balanced and Sustainable Development of the Territory of the EU. Brussels.

ÖSTERREICHISCHES BUNDESKANZLERAMT (1997): Regionalentwicklung im Alpenraum. Vorschläge für die Behandlung des Alpenraumes im Rahmen der europäischen Raumentwicklungspolitik: Schriftenreihe zur Regionalpolitik und Raumordnung Nr. 31. Erstellt durch das ÖIR. Wien.

PERLIK, M (2001): Alpenstädte zwischen Metropolisierung und neuer Eigenständigkeit. Geographica Bernensia P 38. Bern.

PROGNOS AG, REGIONAL CONSULTING (HERRY), ISIS (1998): Study of the Development of Transalpine Traffic (Goods and Passengers) Horizon 2010. Commissioned by the European Commission for Transport DG VII. Brussels.

REGIONAL CONSULTING (2000): Kultur – Landschaft – Entwicklung im westösterreichischen Alpenraum, Teilmodul Raumstruktur und Regionalwirtschaft. (KLF MU4). Wien.

REGIONAL CONSULTING, BIOTECHNICAL FACULTY OF THE UNIVERSITY OF LJUBLJANA; URBAN PLANNING INSTITUTE OF THE REPUBLIC OF SLOVENIA, E.C.O. (2001): Sustainable development of alpine cultural landscapes in the Austria - Slovenia border region. Vienna, Klagenfurt, Ljubljana.

SUSTALP (2000): Evaluation of Instruments of the European Union regarding their Contribution to Sustainable Environment and Agriculture in the Alps. Bozen, Brussels.