



Airport Region of Munich – show-case for a lack of territorial governance

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Abstract

Within the Mega City-Region of Munich the Airport Region plays the role of the backbone that potentially links the City of Munich with the Airport Munich International. The strong development between these two growth poles poses challenges for spatial development. Public transport is inadequate with regard to volume, frequency of schedule and connectivity. Population growth, jobs, as well as direct and indirect economic benefits are increasingly distributed unevenly within the Airport Region. Simultaneous population growth moves on in the nearby regions. While some municipalities object to additional employment and population growth others seem to just passively accept the ongoing influx of people, firms and employment without developing individually – or jointly with neighbouring municipalities – their own urban development strategy.

Public authorities in Bavaria thus face the challenge of re-concentrating economic activities, infrastructure and people within the Airport Region of Munich in order to profit from the advantages that may derive from re-concentration trends in the knowledge economy. Spatial and social proximity, high connectivity by public transport as well as highly accessible knowledge infrastructure can support economic (high per capita costs), ecological (e.g. reduction of land consumption) as well as social sustainability (e.g. proximity).

The paper discusses these challenges and the need for large-scale territorial governance.

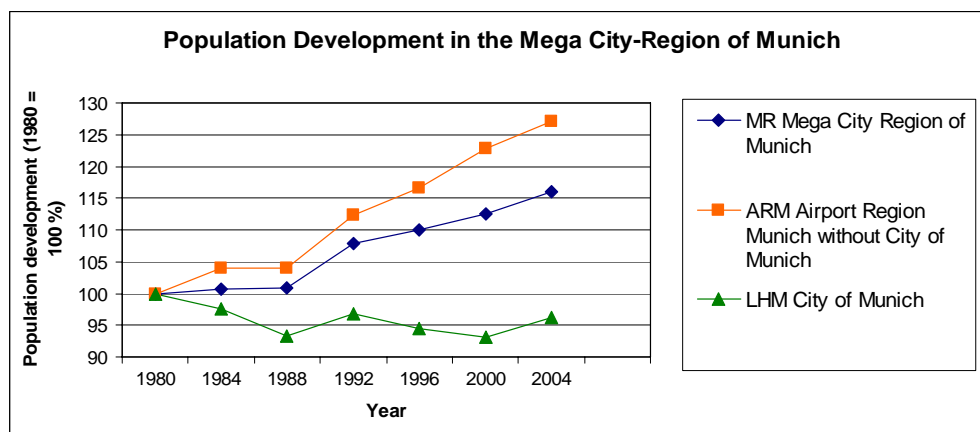
Emerging Airport Region of Munich

Within the Mega City-Region of Munich the Airport Region plays the role of the backbone that potentially links the City of Munich with the Airport Munich International. The strong development between these two growth poles poses challenges for spatial development. The population of the Airport Region is growing more than the population of the MCR (figure 1). A third runway is planned for Munich Airport International, in 2007 the seventh biggest of the European airports, which is a challenge for the Airport Region, too. The planned runway produces fierce arguments between the shareholders of the airport company, the home carrier Deutsche Lufthansa and pressure groups on the one side and the neighbouring municipalities and environmental associations on the other side.

“Airport Region of Munich” is the core region within the Mega-City Region (MCR) of Munich. Mega-City Regions are an emerging new large-scale urban phenomenon. “...Mega-City Regions are a multi-scalar urban process that is currently unfolding on two spatial scales. First, at an international / European level there are increasing functional linkages between the core cities of each MCR. Second, at a metropolitan, regional level there are evident and increasing interdependencies between highly global cores and their surrounding areas. The main driving forces of the emergence of MCRs are knowledge-intensive business sectors leading to a dense network of interaction such as virtual communications and business travel within and between advanced business service firms” (Convery et al., 2006). The EU funded POLYNET project shows that the knowledge economy forces a re-concentration trend, because “...locational concentration and clustering remain key priorities for most global firms across MCRs; there is no evidence that global functions are deconcentrating from POLYNET First Cities”. “First cities have a unique regional role with respect to high-skilled, specialized international labour supplies...” “APS [advanced producer services, the authors] locational decisions are not based solely on rational economic criteria. An attractive ‘city environment’ proves to be significant, but this is more about ‘city processes’ – the ‘buzz’ of the place – than physical infrastructure.” Furthermore, here is importance of the ‘right address’: “mobile talented labour is attracted to specific cities and places; office address and status are critical to the credibility of APS firms, and urban milieux are crucial for fostering innovation” (Hall & Pain, 2006: 197/198).

Next to the crucial importance of the core cities, knowledge economy effects the developments around the core cities. Nowadays face-to-face functions “...disperse over the scale of a wide city region, but simultaneously reconcentrate at particular nodes within it...” “Outside the traditional CBDs these nodes are new CBDs on old industrial or transport land or edge cities often on the axis of the main airport or located at a high-speed train station in a distance. In addition there are far more outside the traditional city situated edge cities like Reading, 40 miles west of London” (Hall/Pain:11).

Figure 1: Population growth rates on different scales (Bayerisches Landesamt für Statistik und Datenverarbeitung, 2007)



The Airport Region of Munich (ARM) will gain growth of the knowledge economy driven re-concentration trend or is already doing this today. The Airport Region of Munich is not an institutional entity; it is a long term hypothesis, an emerging region (Thierstein & Droß, 2006: 4). It has an exceptional function within the MCR of Munich because of the fast growing airport and its effects on to the regional economy. The airport is an important link in an international network of hub airports. It has been shown that the powerful growth of flights at Munich Airport improved the accessibility. Between 2000 and 2004 Munich had the strongest growing of accessibility in Europe, compared with 200 European regions (BAK Basel Economics, 2005: 8). The accessibility depends on the number of reachable destinations and service frequencies at the local airport and of the fast reachable airports nearby. On the other side the number of reachable destinations and service frequencies at all the other airports worldwide improve the accessibility additionally because they offer transfer flights. Hence, together the airports, first of all the hub airports, form a large global network.

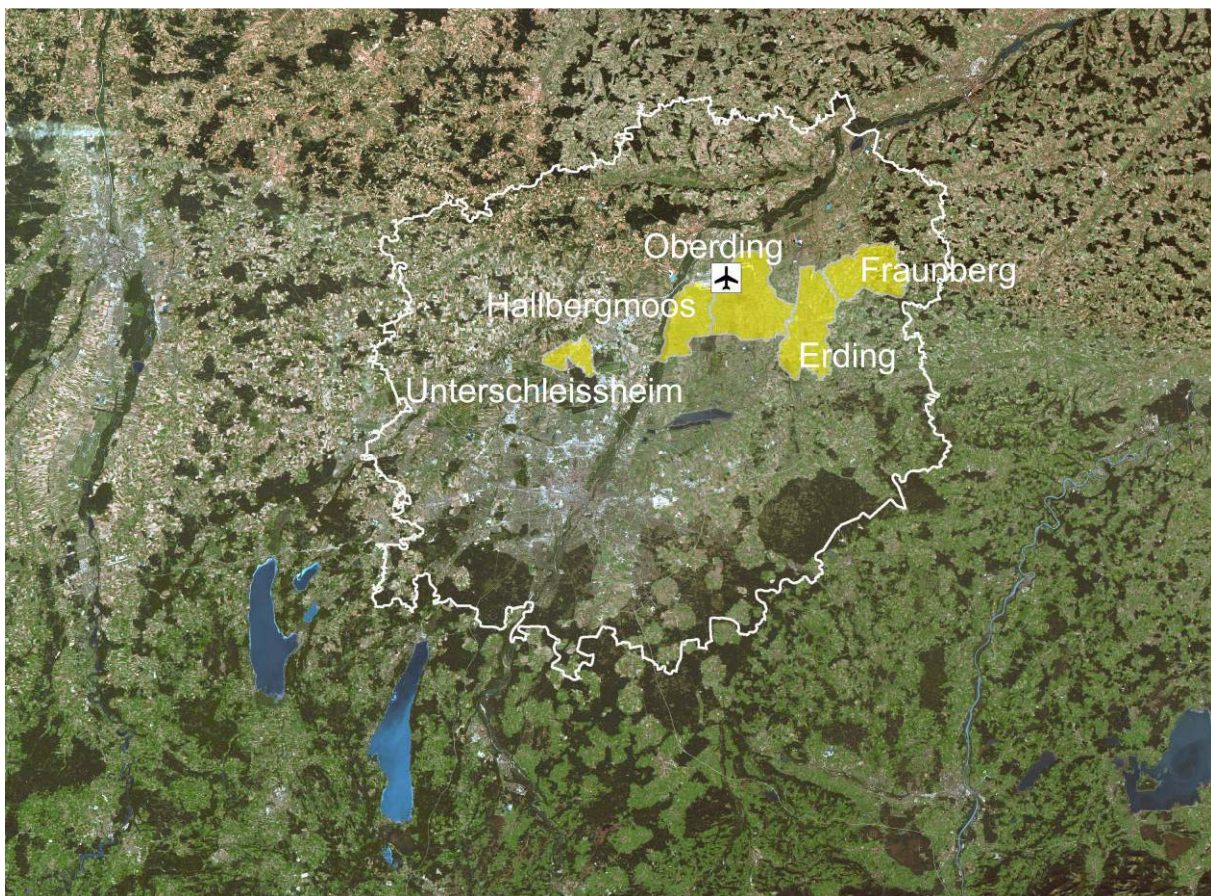
Munich Airport affects the regional economy in three ways. First of all there are the direct effects, which include all investment, running expenses and employment that accrue on the airport premises - currently there are 27 400 people employed (FMG, 2007: 7). For the year 2020 is estimated a number of 41 000 employees, if the third runway would be built. The indirect effects account for all the income and employment, which are generated through supplying the airport firms from the outside. Finally there are the induced effects, which describe the aggregate spending power of the direct and indirect employment of the airport firms.

So far, an airport would create similar effects like any other manufacturing or services activities on the same site. Hub airports on top generate network effects, which come along especially with the characteristics of air traffic. Catalytic effects base on to the rising accessibility, if an airport is opened or extended, which saves time for the passengers and improves the locational factors for the regional economy.

In the Airport Region of Munich many global players are located, like Siemens, Allianz Group, BMW Group, Munich Re Group and others. These firms and many of the other companies are linked together with locations of branch offices, suppliers and so on all over the world. Within the EU-funded project “Sustainable Management of European Polycentric Mega-City Regions“ the information flows between the locations of advanced producer firms were analysed. The results e.g. of the mail traffic show large, sometimes global, E-mail networks (Hall & Pain, 2006: 85). Through such intra-firm and inter-firm networks the ARM is linked together with regions worldwide. Hence, not only the airport is part of a global network, simultaneous the ARM as firm location is part of a global network, too. These networks make the ARM a functional region, which has no territorial borders. The aircraft zones around the airport, the landing paths, the concentration of jobs in the City of Munich and other places, the borders of the administrative districts and of the municipalities form a territorial region. The Airport Region of Munich is both, a functional and territorial region.

Apart from the municipalities there are further territorial institutions, which are responsible for the development of the ARM. The Central State is accountable for the landside access of the airport, the Free State of Bavaria is duty for the regional planning in Bavaria and adopts the guidelines for the spatial development. The Free State is responsible for the regional railway network and the planning approval for the third runway of the airport. Additionally it is the largest shareholder of the airport company; the Central State and the City of Munich are shareholders, too. The regional planning authority of Munich is especially responsible for the spatial development of the ARM. That means, that there are not just one or two institutions, which are accountable for the development of the ARM, there are many more. On the one hand that's typical for a Federal State; on the other hand there are these additional and strong functional actors, the airport and the international firms, which form together with the territorial institutions a mixed multi-level system that acts simultaneously on nested functional spatial scales.

Figure 2: Airport Region of Munich (with marked municipalities which are discussed in the next section)



Although three of these responsibilities refer in particular to spatial planning - regional planning on the Federal State level, regional planning on the regional level and planning competence of the municipalities, there is with

one exception no specific or explicit spatial development strategy for the Airport Region of Munich. The only tangible indication that public planning authorities developed a certain awareness about the unfolding development problems in the larger area around the airport of Munich is a report, which was mandated by the Free State of Bavaria, the administrative districts Freising and Erding as well as the airport company. The objective of the report was to develop a concept for the spatial development of the Airport Region. The report contains a forecast of the airport development until 2015, which is the background for forecasting the population and workforce development until 2015. One of the most important questions was, where the additional inhabitants and employees until 2015 would fit in. According the further settlement developments the report stipulates a higher growth of the larger municipalities because of their good equipment with public and private infrastructure (Bayerisches Staatsministerium für Wirtschaft, 2004: X).

The smaller municipalities did not accept this objective and in the end they were allowed to grow with the average of the forecasted growth rate. Additionally, the municipalities are not obliged to obey the objectives in the report. The concept bases on voluntariness (Bayerisches Staatsministerium für Wirtschaft, 2004: IX). That the smaller municipalities ignore indications laid out in the regional plan is not unusual for the practice of German planning policy. Until today any attempts to concentrate settlement development on to larger and well equipped municipalities failed, because regional planning has not the required instruments to prevent the growth in the smaller municipalities (Droß, 2004: 130).

The Munich regional plan contains only one forthright objective for the ARM. It stipulates that especially the rural part of the surrounding area should profit from the economic effects of the airport. The plan suggests future growth mainly in the rural municipalities in the north and east of the airport. Only two of the municipalities suggested for growth are situated in the growth corridor between the city of Munich and the airport (see next chapter). Again, this objective doesn't legally bind the municipalities. Hence, until today the settlement growth is left to the individual municipal planning of the ninety-five municipalities, which are part of the ARM. While some municipalities object to additional employment and population growth others just seem to just passively accept the ongoing influx of people, firms and employment without developing individually – or jointly with neighbouring municipalities – their own local development strategy.

Public authorities in Bavaria thus face the challenge of re-concentrating economic activities, infrastructure and people within the MCR on to the ARM and within the ARM on to the local communities between the growth poles airport and City of Munich in order to profit from the advantages that may derive from re-concentration trends in the knowledge economy. Concentration and highly dense locations are relevant for the knowledge economy as well as for the concept of sustainable settlement development. The latter consists of conserving undisturbed landscape, land-saving buildings, mixed-used locations, high connectivity by public transport and using existing infrastructures to save costs. According these guidelines further settlement developments shall concentrate rather on to cities than on to small municipalities, because the latter usually are not well connected with public transport and also are not well fitted with infrastructure. Spatial and social proximity, high connectivity by public transport as well as highly accessible knowledge infrastructure can support economic (high per capita costs), ecological (e.g. reduction of land consumption) as well as social sustainability (e.g. proximity). The paper discusses these challenges and the need for large-scale territorial governance.

The following second section discusses spatial development conflicts in the ARM. The spatial requirements of the knowledge economy will be connected with the results of the spatial development analyses in the third section. We will demonstrate why a joint strategy is necessary and what the core issues of the strategy are. Subsequently conclusions will be drawn.

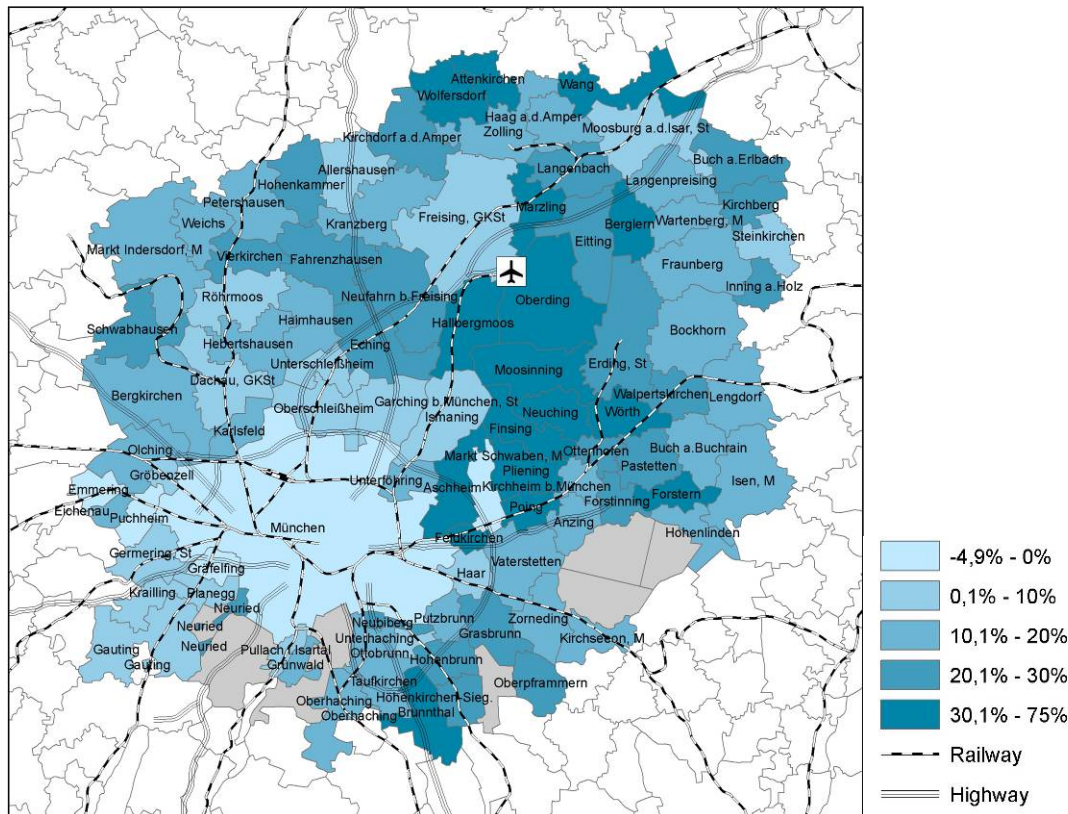
Spatial development and development strategies

The relocation of the airport from the city limits of Munich to the “Erdinger Moos”, 28 km in the north of the City of Munich has generated strong settlement developments since the opening of the new airport in 1992. Most of the developments took place around the airport and in the corridor between the City of Munich and the airport.

Settlement Development in the Airport Region of Munich

In the ARM the population grew from 1980 to 2004 with 132 263 people, what equals 6.7 % (source of all following data: Bayerisches Landesamt für Statistik und Datenverarbeitung, 2007). In 2004 in the ARM 2.1 Mio. People are living. The municipalities around the airport had a large increase of inhabitants in the decade before the opening of the airport in 1992. Hallbergmoos for example, located just in the south of the airport, grew between 1980 and 1992 with 66 %. But only the smaller municipalities had this growth, the larger cities near the airport, Erding and Freising, increased only with approximately 10 %. After the opening of the airport the growth patterns are the nearly same, only a corridor of population increase from the north-east of the City of Munich to the airport is more distinctive.

Figure 3: Relative population development 1992 – 2004 (data: Bayerisches Landesamt für Statistik und Datenverarbeitung, 2007)



Because the concept of sustainable settlement development requires the development of larger municipalities, it is fundamental to know how the different sized municipalities have developed. We built 6 classes of municipalities, which take the municipal population in the year 2004 as indicator for their size (see table I). The municipal population varies strongly. The smallest municipality had 904 inhabitants and the biggest one, the City of Munich 1.25 Million inhabitants.

Table I: Municipality size classes

Classes	Inhabitants 2004	Frequencies
1	up to 2.500	13
2	2 501 to 5 000	27
3	5 001 to 10 000	23
4	10 001 to 15 000	15
5	15 001 to 20 000	7
6	20 001 and more	9

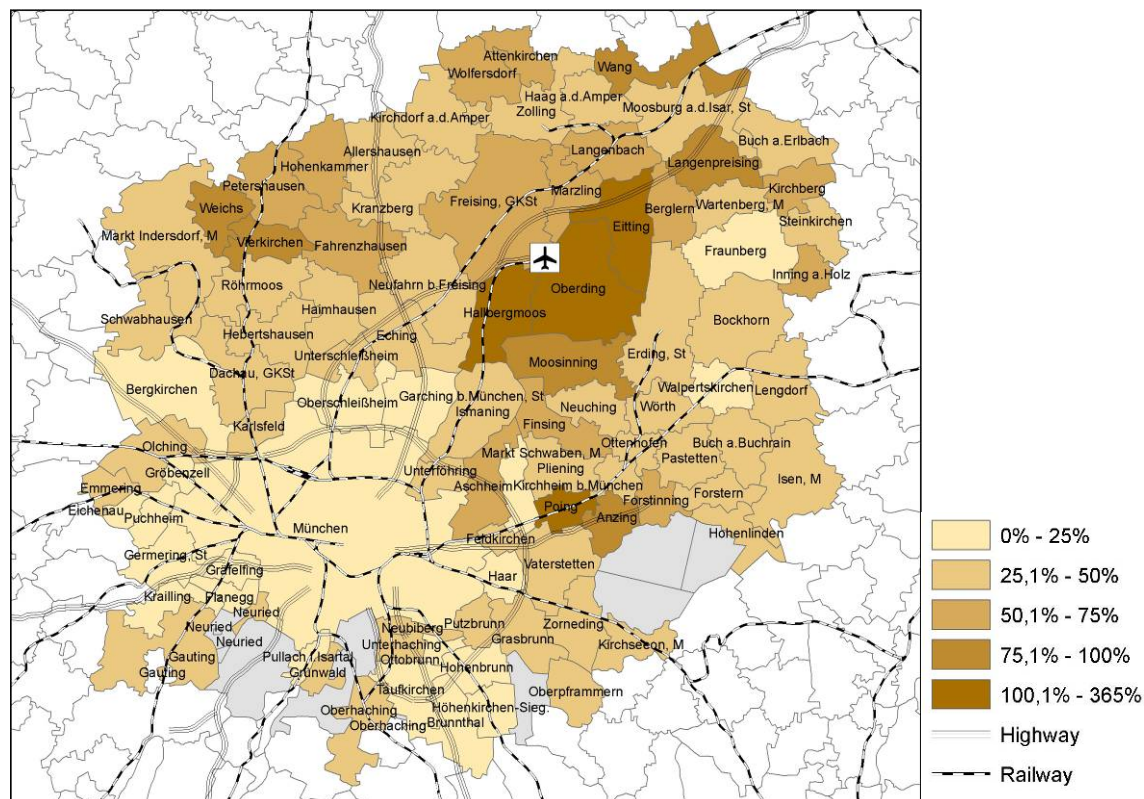
In the ARM the employment grew from 1980 to 2004 with 145 898 employees, what equals 17.6 %. The development of employment shows the same growth corridor between the City of Munich and the airport as the population development. Similar to the population development the strongest relative development of employment takes place in the small municipalities (see table II with the complete data).

Table II: Development of employment according to municipality size (data: Bayerisches Landesamt für Statistik und Datenverarbeitung, 2007)

Population	growth of employment 1980 to 2004	change of employment 1980 to 2004 in %
up to 2.500	1575	118
2 501 to 5 000	7050	113
5 001 to 10 000	35096	145
10 001 to 15 000	28532	79
15 001 to 20 000	17359	61
20 001 and more	56286	87

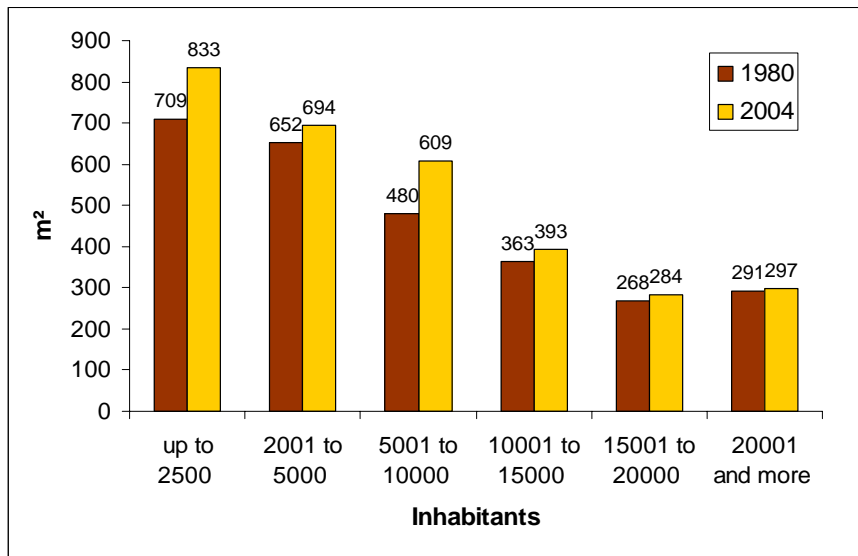
The settlement areas in the ARM grew from 1980 to 2004 with 15655 ha; the relative increase was 46 % in these 25 years. The following map shows the strongest increase north, north-east and east from the City of Munich up to 186 %.

Figure 4: Relative development of settlement area 1980 – 2004 (data: Bayerisches Landesamt für Statistik und Datenverarbeitung, 2007)



The settlement area per Person grew from 1980 to 2004 from an average of 501 m² to 571 m². The smaller the municipality the higher is the settlement area consumption per person. In the municipalities which have less than 2 000 inhabitants the settlement area per person was in 1980 705 m², in 2004 784 m² per person. In the bigger municipalities the value is between 245 and 300 m² according to their higher building density.

Figure 5: Settlement area per person in 1980 and 2004 according to municipality size, (data: Bayerisches Landesamt für Statistik und Datenverarbeitung, 2007)



The smaller municipalities grew much more than the bigger ones (see table III). The class of the municipalities with more than 20 000 people declined according to a large loss of inhabitants in the City of Munich.

Table III: Population development according to municipality size (data: Bayerisches Landesamt für Statistik und Datenverarbeitung, 2007)

Population	Population development 1980 to 2004
up to 2 500	8 419
2 501 to 5 000	32 494
5 001 to 10 000	42 741
10 001 to 15 000	38 978
15 001 to 20 000	12 740
20 001 and more	-3 109

The development in the ARM shows large population and employment increases, particularly in the small municipalities. Many of them don't have access to the public transportation network, e.g. Hohenkammer, Allershausen, Wolfersdorf, Langenpreising and Eitting. Additionally these small municipalities have the largest land consumption per person. Developing areas without access to the public transportation network and with high land consumption don't comply with the requirements of sustainable spatial development and is in general correlated with high infrastructure costs per capital. Consuming large areas for building houses requires more infrastructures. According to a calculation of the costs for primary schools and for fresh water, sewage, streets and long-distance heating a land consuming development would produce costs of 485 Euros per inhabitant. However a sustainable development would produce costs of 410 Euros per inhabitant (Einig & Siedentop, 2006: 118). The next obvious result is a strong growth corridor of population and employment between the City of Munich and the airport, which bases on the proximity to the growth drivers – the City of Munich and Munich Airport.

Examples of development of municipalities and municipal strategies

In our Seminar 'Airport Region of Munich' we analyze future settlement strategies of the municipalities in the ARM. The analyzed municipalities differ in their population size (see table IV) and situated in different parts of the ARM (see figure 2); all of them have a growth rate of more than 100 % between 1980 and 2004.

Fraunberg

Fraunberg is situated just at the north-eastern boundary of the ARM. The population of Fraunberg has more than doubled between 1980 and 2004 (see table IV, all following data: Bayerisches Landesamt für Statistik und Datenverarbeitung 2007). Since 2000 the growth rate has been declining because the municipality has set strict boundaries for growth. It reserves all building sites for locals, to prevent any influx from outside. The landowners circumvented this rule with renting their houses to people from outside. The municipality committed

penalties to prevent the landowners doing this. The landowners went on with renting their houses and paid the penalties. The municipality reacted with enlarging the penalties. Before some years Fraunberg wanted to develop an industrial estate in cooperation with their neighbour municipality Erding, but it didn't take place. The political leaders of Fraunberg seem to be afraid of growth and there are no preparations for future growth. Fraunberg is situated not far from the airport in a beautiful landscape and people are interested to live there, what the efforts of the landowners show to rent out their houses. If the third runway will be build, a large growth is expected (Schott & Zitzelsberger, 2007).

Table IV: Population development (data: Bayerisches Landesamt für Statistik und Datenverarbeitung 2007)

Municipality	1980		2004	
	Population	Employees	Population	Employees
Fraunberg	2 449	187	3 250	263
Erding	23 758	8 259	32 953	11 120
Unterschleissheim	2 400	3 539	2 764	12 495
Oberding	2 898	347	5 144	2 044
Hallbergmoos	3 534	545	8 252	4 890

Erding

Erding is the capital of the east part of the ARM. The population grew between 1980 and 2004 with 139 %, per year 5.8 %. Erding is well fitted with infrastructure; some large companies are there (i.g. amadeus, a global travel distribution system) and Erding will be linked to the interregional railway network and a direct railway to the airport in the next years. For this link the station has to be moved, so Erding will get a new development area. Although these good conditions the municipality wants to reduce its growth onto 0.3 to 0.5 % per year, which would be much less than the growth rate of 1,6 %, which Erding had from 1980 to 2004.

Unterschleissheim

Situated just north of the City of Munich Unterschleissheim has with 12 495 in 2004 employees one of the biggest job concentrations in the ARM. The population stagnates since 1992, although just in 1992 the airport has opened. The municipality has not much building sites because of motorways in the north-west and north-east.

Unterschleissheim

Unterschleissheim is not very attractive for living there, because it has no pleasant city centre and not much high quality housing. Additionally, the newer building sites in the south east are not well connected to shops and private and public services. In Unterschleissheim the fluctuation rate is high (Stehbeck et al., 2007). Obviously there is a need to develop and to improve housing in Unterschleissheim. Unterschleissheim has an advanced strategy for job development in the industrial estate with many firms of the knowledge economy, however no strategy for housing development. For example it could be possible to mix housing and jobs in the industrial sites in the north, which have a good infrastructure and shops and restaurants. Another possibility would be a joint developing strategy with municipalities around.

Oberding

Oberding is one of the airport municipalities; one half of the airport is lying on its ground. Oberding profited much from the airport and could increase its number of employees several times. Part of this growth is the airport workforce, which is working in that part of the airport, which is situated on the territory of Oberding. Between 1980 and 2004 the population grew by 178 %; currently Oberding has 5 141 inhabitants. A disadvantage of Oberding is a lack of retail shops. In the main part of Oberding is even no shop (Herbster & Schulz, 2007). The access to public transport is poor; a bus goes every 80 minutes, the last one before 10 p.m (Münchner Verkehrsverbund, 2007). A commuter train stop is planned, but only for the northern part of the municipality. Oberding wants to grow another 3 000 inhabitants in the next years in spite of the awkward access to the public transport network (Herbster & Schulz, 2007).

Hallbergmoos

Hallbergmoos had a population increase of nearly 1 000 %, the jobs grew from 545 in 1980 to 4 890 in 2004. As in Oberding this numbers include a part of the airport workforce. The settlement development went on in the south, because in the north the airport is situated on the area of Hallbergmoos and blocking further developments. Hallbergmoos has had much profit from the airport; the social infrastructure and private services have been expanded, new shops and a better public transport system have made Hallbergmoos more liveable (Stallmeister, 2007). Hallbergmoos accomplishes an intensive and well documented municipal development

planning (Gemeinde Hallbergmoos, 2006). The development plan sets a maximal growth rate of 80 % until 2025.

The strategies of the analysed municipalities are different – if they have any perceivable strategy. They dislike future growth, want to reduce their growth or have no idea about future developments. Only one municipality has a appropriate growth strategy.

Collaboration in the ARM

In the ARM are working two municipal collaborations. The “North Alliance” is a collaboration of eight municipalities within the corridor between the City of Munich and the airport. The joint venture “Airfolgsregion” links together the two administrative districts Freising and Erding, in which the airport site is situated, their capitals and the airport company.

The “North Alliance” was founded in the eighties because many large negative infrastructures were built in the municipalities just north of the City of Munich (Nordallianz, 2005), e.g. a nuclear plant, a rubbish dump and a clarification plant. The alliance tried to block further negative infrastructures. In the last years the alliance changed its character and got a marketing association. One of the topics of the North Alliance is the marketing for industrial and housing sites (Nordallianz, 2007).

The “Airfolgsregion” was founded in 2005 to set up a network between the airport and the region, to initialize a coordinated regional development in the administrative districts and to extend and strengthen the competitiveness of the region. To reach these objectives the association tries to integrate all relevant groups, strengthen the regional identity, to set up a network between the regional actors and existing projects and to start new projects (Airfolgsregion, 2007). In the last years the work of the joint venture focussed on marketing issues. The North Alliance is an important association for the ARM, because it represents the municipalities in the airport corridor. Until today this association generates no real profit for a joint settlement development. An example of co-operation between private and public institutions is the Airfolgsregion. The collaboration issues are nearly the same as by the North Alliance, but go further into the field of regional development.

The analysis shows that there is no overarching settlement development strategy for the ARM. The Munich regional plan doesn’t state much about the development in the Airport Region and its only objective about the Airport Region doesn’t obligate the municipalities. The brief analysis of municipal strategies indicates that there are municipalities in the ARM, which even don’t have a comprehensible strategy for their own territory. Otherwise the review of the settlement development demonstrates that the developments in the past consumed much settlement area and tended to produce high infrastructure costs.

Joint territorial strategy: specialisation and concentration on regional scale

To reduce the rising land consumption and the costs of settlement development a territorial strategy is required, which follows the standards of sustainable spatial development, which means generating highly dense and mixed-used locations. These locations should be linked with a high quality public transport system to reduce congestion and carbon emissions. Settlement development is a scale sensitive phenomenon. Not only on the local level settlement development strategies have to be reviewed and changed, because the municipalities follow their own individual strategies which do not consider the impact of municipal development on to the regional development. Additionally, it is useful to concentrate future workforce and population developments on to these municipalities, which are well connected to the public transport system. Hence a regional strategy is required which considers infrastructure costs, the accessibility with public transport and the development of highly dense and mixed-used locations.

Thinking the knowledge economy as a challenge for territorial strategies

Concerning the functional importance of the ARM it would be interesting to know, which particular spatial requirements knowledge-intensive firms have. As there is little concern for the crucial interrelationship between the changing requirements of knowledge-intensive firms and urban change, the ability to use this knowledge for local and regional development and spatial planning purposes is still weak. The POLYNET project demonstrates a high importance of functional concentration to the core cities of the MCR’s: “Concentration of global functions and specialisms in these primary cities remains essential for high-complexity/high-value knowledge transfer, innovation and production” (Hall & Pain, 2006: 208/209). Thus the City of Munich needs options for further developments, which means restructuring of existing locations but also could require new building sites. The City of Munich has a limited availability of building sites, which will terminate in about 20 years (Reiss-Schmidt, 2007: 52). A long term development strategy for the ARM has to consider the demand for future development areas – not only for the City of Munich. As mentioned there are other locations with knowledge intensive firms which have limited building sites, too, like Unterschleissheim. Hence it is essential to ask today for new locations or for locations which can be restructured and to design a territorial agenda for the ARM.

Currently “...face-to-face functions ...disperse over the scale of a wide city region, but simultaneously reconcentrate at particular nodes within it...” (Hall/Pain: 11). Within the ARM there are such nodes like Freising, Unterschleissheim and Garching, the largest location of Munich Technical University.

Core issues of a joint territorial strategy

The Munich Technical University (TUM) is a good example for the location management of a knowledge intensive institution. There were two former universities, one in the City of Freising and one in the City of Munich. After merging the two schools the university developed both locations, Munich and Freising. Currently, the university has 3 main locations; a campus in Garching is the major development location, since all technical and natural sciences move from the traditional location in the City of Munich to Garching. In Garching the required infrastructure has to build, like the access to the public railway network, shops, restaurants and flats for students and staff. It lasted several years to link the campus Garching to the public railway network. Today it takes 34 minutes by underground to switch from Garching to the TUM centre in the City of Munich, but even now it takes between 49 and 57 minutes to go from Garching to the TUM in Freising, that's plenty of time for students which study in Garching and Freising. Concerning the development strategy the TUM has to decide where to locate additional functions like a congress centre. Currently the 'TUM International Congress Centre' is planned in Garching (Technische Universität München, 2006: 4) and the question comes, if Garching is the best location for a congress centre, because the City of Munich is much more attractive for such a knowledge intensive function.

This example indicates core issues for a joint territorial strategy for the ARM; commuting between locations of the same institution or different institutions (and firms), accessibility, the quality of proximity and a mix of different public and private services, different and specific location qualities and the question how to find the best location for a specific function.

The ARM-municipalities are claimed to develop their different and specific qualities. Not every municipality has the preconditions to be a suitable location for knowledge intensive firms, but the municipalities could develop their potentials. Fraunberg could offer up-scale flats and houses in a rural landscape, Erding could offer a mix of an attractive province city in a short distance to the airport and jobs for high qualified workers. Additionally Erding could try to attract more firms with a dense mixture of shops, services and the new railway link to the region and the airport. These municipalities which have already a good access to the public railway network and knowledge intensive firms should qualify their infrastructure, shops and public and private services.

Specialisation and concentration on the regional scale are the key words of this strategy, which depends of a municipal commitment to work together and to face the challenge of population and job growth in the core region of the MCR of Munich, the ARM. It must be a joint strategy, because the development of the growth corridor between the City of Munich and the airport needs a commitment as well as finding the best locations for future requirements of building sites, when the City of Munich achieves its limit. It is not necessary that every municipality offers as much as it can, but it should offer the best what it has.

In the end it could be possible to bring together the requirements of sustainable spatial development and the emerging knowledge economy. Spatial and social proximity, high connectivity by public transport as well as highly accessible knowledge infrastructure can support economic (high per capita costs), ecological (e.g. reduction of land consumption) as well as social sustainability (e.g. proximity).

Conclusions

The municipalities face the challenge to manage the growth of the ARM with a joint strategy and to develop their specific potentials. Currently the municipalities follow individual strategies and some of them want to reduce their future growth. Managing the growth of jobs and population requires a joint strategy, because not all of the municipalities have enough building sites or access to the public transportation networks or other preconditions of sustainable development. Also municipal cooperation could reduce settlement development costs, e.g. infrastructure costs. Working together in developing the ARM offers the chance to concentrate on the respective location economies, to develop the specific potentials and the 'buzz' of the place.

The development of dense and mixed-used locations with a high accessibility of public transport in the growth corridor between the City of Munich and the airport could support both, sustainable development and the emerging knowledge economy. On the other side, the knowledge economy could foster this concentration strategy. Developing areas without access to the public transportation network and with high land consumption is affiliated with high external costs due to infrastructure development and congestion. Knowledge intensive firms require proximity and face-to-face exchange of information, so that they produce agglomeration forces.

To implement such a concentration of settlement development along important nodes of the public transport system collaboration between the municipalities is necessary. Without a commitment of the municipalities of the

ARM it will not be possible to find and develop those locations which have the best preconditions for specific functions, e.g. locations for varied qualities of housing, locations for knowledge intensive firms or locations for recreation and sports.

The joint strategy requires more actors than the municipalities alone. Any territorial governance has to consider the nested functional spatial scales and the multiple actors, institutions and responsibilities in a federal state. There is at least the Central State and the Federal State of Bavaria with their responsibilities for the landside access of the airport, the national and regional railway and road network and the regional planning guidelines. Also private actors are important for developing territorial strategies. The joint venture “Airfolgsregion” shows one example of a cooperative endeavour between public and private actors.

The basis of a joint strategy is the awareness of being the core region of the MCR of Munich. The functional meaning of the ARM is crucial, if it comes to a joint venture between the municipalities and other stakeholders, e.g. the airport company. Firstly, the driving forces – most of all the catalytic effects – of the hub airport are necessary to understand. Secondly the function of the ARM for the MCR is significant: the strongest growth drivers of the MCR are situated in the ARM, namely the City of Munich and the airport.

There is a mismatch between the functional regions MCR of Munich and ARM and the traditional territorial approaches of policy makers and planners. Currently there are no spatial strategies which consider the important function of the ARM. However, the above mentioned report, mandated by the Free State of Bavaria, the administrative districts Freising and Erding and the airport company FMG tried to set up a joint strategy. However, it was impossible to initiate a developing process, which on the one hand would have had a reasonable chance to make a difference with regard to the settlement development and on the other hand would have been supported by all municipalities of the ARM. There seems to be a lack and an uneasiness in applying multi-scalar functional thinking. The predominant thinking is in terms of physical infrastructure, morphological structures and territorial boundaries. This makes sense for politicians and their administrators because territorial boundaries define their constituencies and hence their electoral markets. Nevertheless, functional thinking could be helpful to overcome traditional territorial thinking, which contributes to unsustainable development and hampers the awareness of the advantages of the knowledge economy. Finally, the agglomeration forces of the knowledge economy could be helpful to foster re-concentration and therefore a more sustainable spatial development.

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