Conclusions and Perspectives after Forty Years of Trying

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Abstract

This paper presents a few main conclusions at the end of a professional life spent in teaching and research, on the one side, and in various associations with practical tasks of spatial planning, programming, and project preparation, on the other, in a very condensed, and hopefully provocative form. It expresses the opinion that some of the most fundamental issues of coming to better advice from academics to practitioners have not yet been dealt with appropriately, in particular the following four:

1. Infrastructure, which was and still is neglected in academic research;
2. Hierarchies and systems of interconnected socio-economic and ecological spaces which respond to real world situations are not yet systematically established;
3. Nonlinearities and interdependencies of effects of development programmes and projects which regularly appear in reality are not yet sufficiently considered in methods of plan, programme and project evaluation;
4. Little attention is given to systematically determine adequate systems of information for planning, programming and evaluation.

These four points will be dealt with in some detail. However, without having the time to elaborate on other issues also considered of crucial importance for the future of Regional Science, it is just mentioned

- that the problematic of justifying any particular multi-regional and multi-dimensional sets of development objectives, which are required by every budget-preparing government, has not found the necessary attention in the scientific world,
- that, at least in the Western countries, the funding of real world policy-orientated research in spatial development is totally insufficient, and
- that the required integrity of academics with regard to their responsibility as teachers and advisors is dwindling away in the light (and shadow) of lucrative contract-research.

In order to avoid the impression that the purpose of the paper is to blame whomsoever, illustrating examples will be taken from my own work and experience only – including blame on myself for what I did not achieve and where I did not fight enough in favour of better solutions (independent of the fact that in quite many cases understanding but competing colleagues often preferred to stay quiet and to rather pursue traditional, less "risky" approaches): I sometimes had to pay a price even when I lost.

1 Infrastructure

Infrastructure was and still is neglected in academic research and insufficiently taken into account in real world development plans and programmes: Virtually all studies concentrate on particular parts of the material (physical) infrastructure system of a region, or a country, and to a lesser extent consider personal infrastructure ("human capital"). Studies and programmes in most cases totally neglect the basic (trivial) insight, that infrastructure, as the foundation of the optimal functioning of markets, always comprises three elements, namely material, personal and institutional infrastructure.

Despite this basic insight the institutional framework of development is left to public administration experts, to development sociology researchers, and some other fields of expertise - but not, or only exceptionally, integrated into development planning and programming, and related research.

As an example from my own bitter experience I show two pictures: The first one illustrating my early little pride of having organised the construction of Nepal's first sewage treatment station (in Bhaktapur), and the second one showing the non-functioning of this system, a few years later, due to the absence of any regulation on the cost sharing, the establishment and stepwise introduction of which I had strongly proposed. When my proposal was not accepted, because neither Nepali government officials not German development aid officials liked to become responsible of a new way of making citizens "pay" for a service, this became a major reason for giving up my role as a project advisor, and resigning from my contract.

***Photo 1**: Nepal's First Sewage Treatment Plant Constructed under the Bhaktapur Development Project*

***Photo 2**: A Few Years Later: Out of Operation (due to the fact that the complementary institutional framework was not established and no funds were available for maintenance*

(Photos: Peter Treuner)

The government agency carrying out official German development cooperation projects, of course, did not really like my stubborn maintaining of what I considered necessary, and did not consider me anymore for advisory tasks - the price was to be paid.

What is needed is the integration of aspects of *all three elements* of infrastructure into methodical approaches to project and programme preparation and evaluation: in particular legal and organisational aspects must be taken into account. Unfortunately, for the time being, there is no perspective of overcoming this problem.

2 Development-Adequate Spaces

Today we know that an uncountable number of spatially differentiating studies of development problems and approaches have been carried out, many of them producing new information and relevant insights. However, convincing and practicable "standard" hierarchies and systems of interconnected socio-economic and ecological spaces which would facilitate sustainability-related development planning and programming have not yet been systematically established:

The well-known dichotomy of socio-economic spaces vs. administrative spaces has not yet been solved in a general way, and no practically applicable theoretical concept is available; despite available technical instruments (RS, GIS) solutions are only found case by case, with the consequence that most of such solutions (which often can be considered as innovative and good) cannot be compared to other similar solutions.

Also, the trivial insight that "directed" spaces are required for many types of analysis if these should provide insights and advice with regard to practical applications, e.g., for meaningful analyses / forecasts of traffic flows (when non-symmetrical), has not yet been accepted generally. While it is quite obvious that administrative territories, and even artificially defined systems of hexagonal catchment areas (as sometimes used by public transportation systems), do not show the really relevant catchment areas because people will not automatically choose "their" access point but rather the most practical (e.g. shortest way) one with regard to their particular destination. Figure 1 illustrates this effect for a fictitious example.

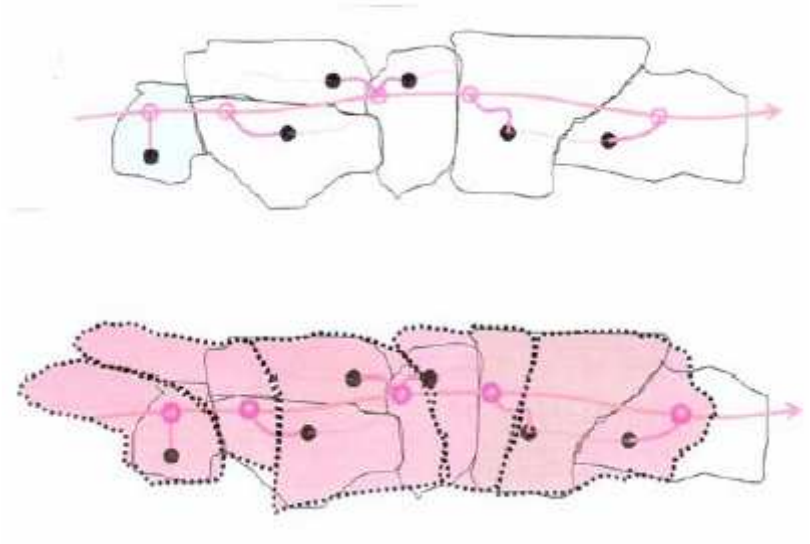
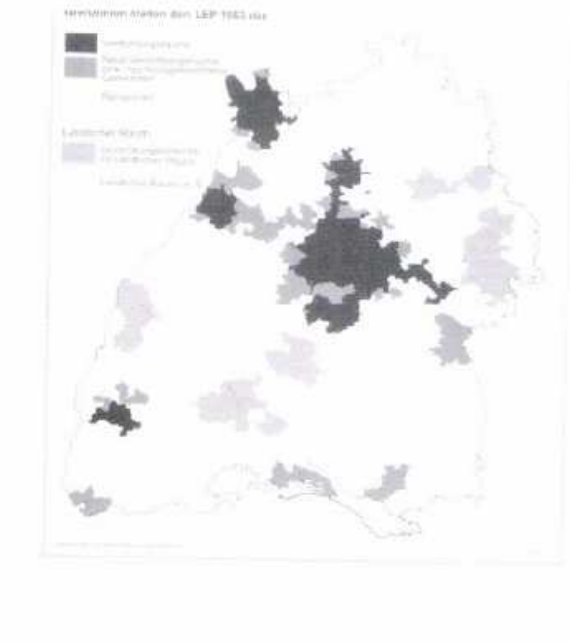


Figure 1:
The upper part of the figure shows a highway passing through six different territories belonging to six settlements (administrative units) all linked to the highway.

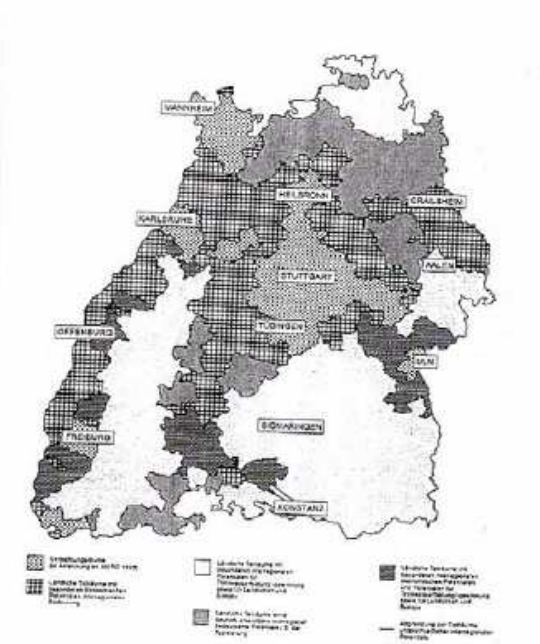
The lower part shows the relevant "catchment" areas of the five points of access to the highway in case the majority of travellers from the settlements would wish to reach destinations in the East – obviously quite different from the administrative territories.

My slides show only three typical and regularly appearing (concrete) examples of problems related to the choice of adequate spaces:

(A) Maps 1 and 2: The case of a new proposal for defining spatial categories to be used for state development planning in the state of Baden-Württemberg (Germany) [1] that would have included those ecological criteria as, in principle, agreed with the state planners [2], but not accepted because of lacking "opportunity" to abandon the traditional categories of density-defined types of planning areas;



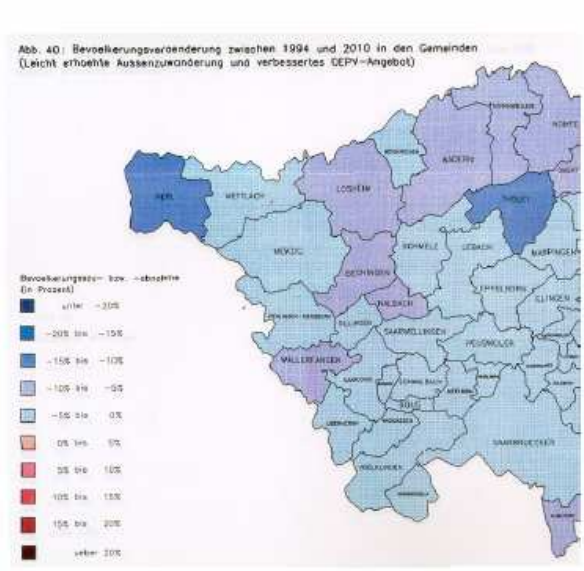
***Map 1**: The officially defined spatial categories of the State Development Plan of Baden-Württemberg* [1]



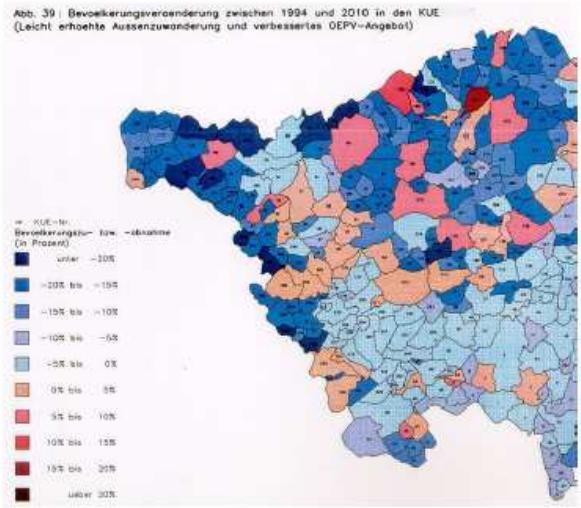
***Map 2**: A proposal for a new definition of areas elaborated by Treuner and Winklemann* [2]

(B) Maps 3 and 4: Cartographic presentation of (a part of the) highly disaggregated population forecasts for the German State of the Saarland, commissioned by the State Government as a basis for elaborating a new State Development Plan, (I) by the administrative territories of the communities ("Gemeinden" = lowest level units of government) and (II) by the towns and villages (settlements) within these communities [3]; the comparison shows significant differences within the communities which, of course, disappear when the data are presented at the community level.

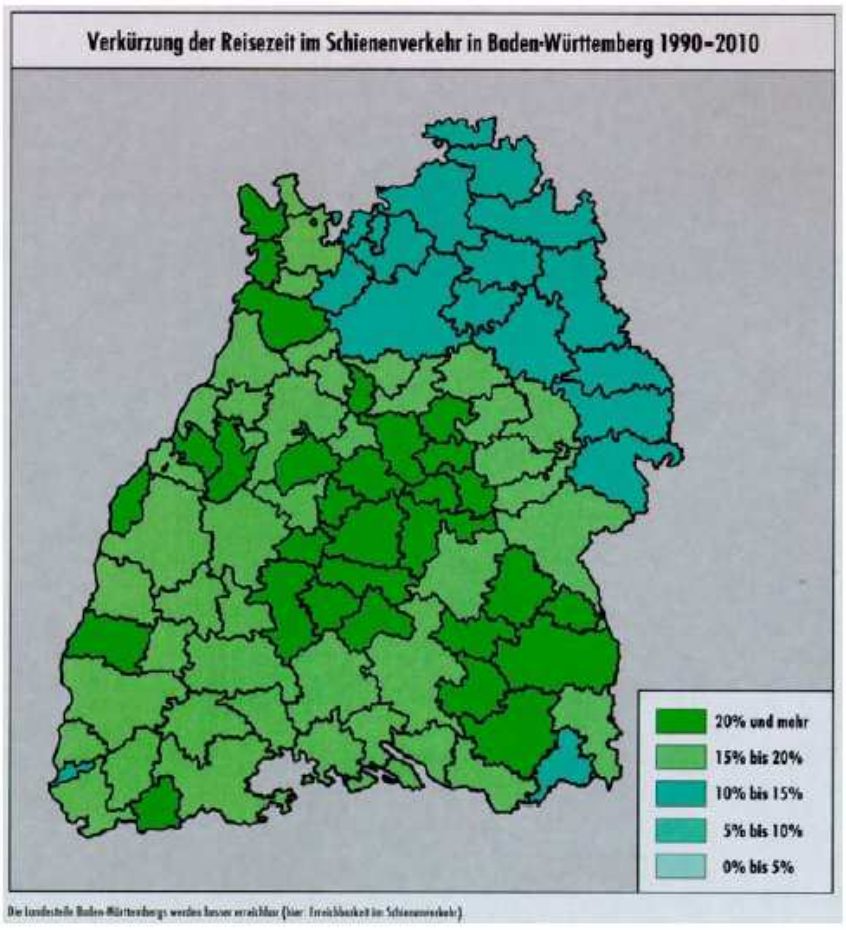
(C) Map 5 is taken from the report on the new State Transportation Plan published by the Government of Baden-Württemberg for which an analysis of the spatial effects of the proposed new infrastructure projects (road and rail construction) had been elaborated in the Institute of Regional Development Planning of the University of Stuttgart [4]; this map (adapted from the research report) shows that, in contrast with the government's intentions and its public declarations, the greatest improvements would not be produced in the worst serviced areas of the state, but in fact in those parts of the state which were already (relatively) best served.



***Map 3**: Population Forecasts for the Saarland by Administrative Communities* [3]



***Map 4**: Population Forecasts for the Saarland by Settlements within the Administrative Communities* [3]



***Map 5**: Spatial Effects of the Projects Proposed in Baden-Württemberg's Last Transportation Infrastructure*

Master Plan (GVP) [4]

(in reduced travelling times as % of original values)

In particular, the integration of ecologically defined "eco"-spaces with other spatial entities through standardised procedures remains virtually unexplored; "arbitrary" integration in a "case by case" approach is still the rule, giving scholars and researchers the opportunity to produce ever more sophisticated proposals, and earn praise in conferences - but the real world challenge remains without answer.
Figure 2 below and Figures 3 and 4 (on the following page) illustrate one recent proposal elaborated by a Sino-German team of researchers from eight different institutes (brought to an international conference of experts organised by UNESCO [5, 6, 7, 8]) which is shown as an illustration only of the tremendous methodical difficulties that must be overcome if the objective is to come to some sort of a standardised approach to provide "adequate" inputs into land use planning, just as economists, more than fifty years ago, finally agreed on a *compromise* concerning the definition of macro-economic income (e.g. GDP).

Conditions for Transfer		"Ecological Value of Land"			
		low	medium	high	very high
"Socio-Economic Needs"	very high	unrestricted use	on the basis of simplified env. impact analysis	after normal env. impact analysis only	on the basis of special studies only
	high	on the basis of simplified env. impact analysis	on the basis of simplified env. impact analysis	after normal env. impact analysis only	to be used in exceptional cases only
	medium	on the basis of simplified env. impact analysis	after normal env. impact analysis only	after normal env. impact analysis only	absolute protection
	low	on the basis of simplified env. impact analysis	after normal env. impact analysis only	to be used in exceptional cases only	absolute protection

Figure 2*: Example of a "Final Classification Matrix" Resulting from a System of Input Matrices Which Take into Account all Available Information on Socio-Economic and on Ecological Facts Considered Relevant* [5, 6, 7, 8]

What is needed is a scientifically well-founded convention on spatial categories to be used for official (including planning) purposes - which would allow comparable results of studies and plan and programme appraisals. While regional planning authorities are not at all eager to support research approaches in this direction, there may be a perspective in so far as e*cology*-orientated research may find the funds required for such empirical studies (which are always costly) - however, this may include the danger that socio-economic aspects will receive less attention than necessary.

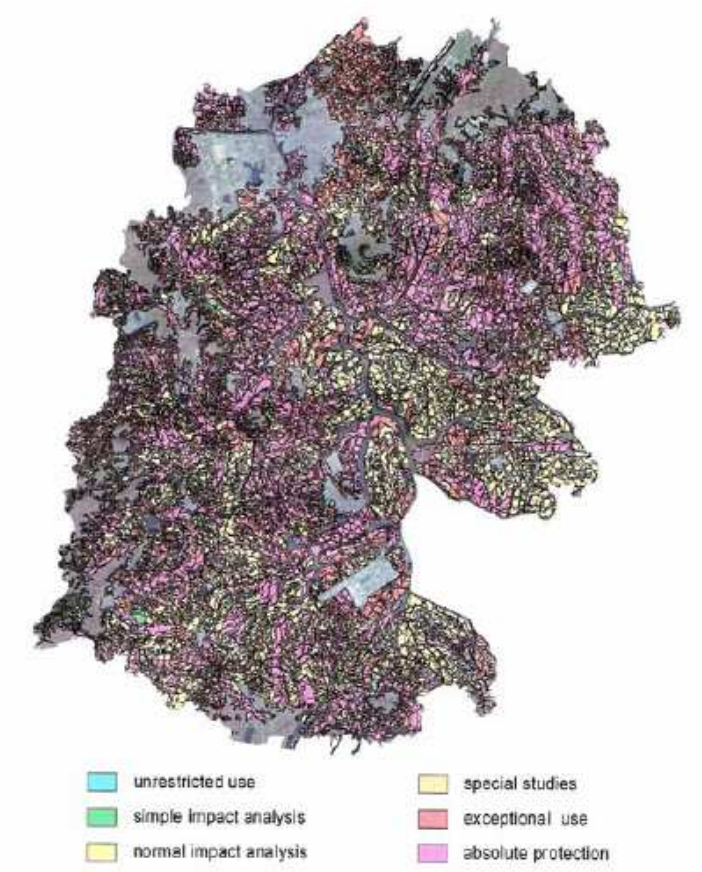


***Figure 3**: First Application of a "Final Classification Matrix" as a basis for decisions on land use planning (land use plans) in the Jiangning District of Nanjing in the P. R . of China (592 km2 subdivided into almost 43,000 plots)* [5, 6, 7]

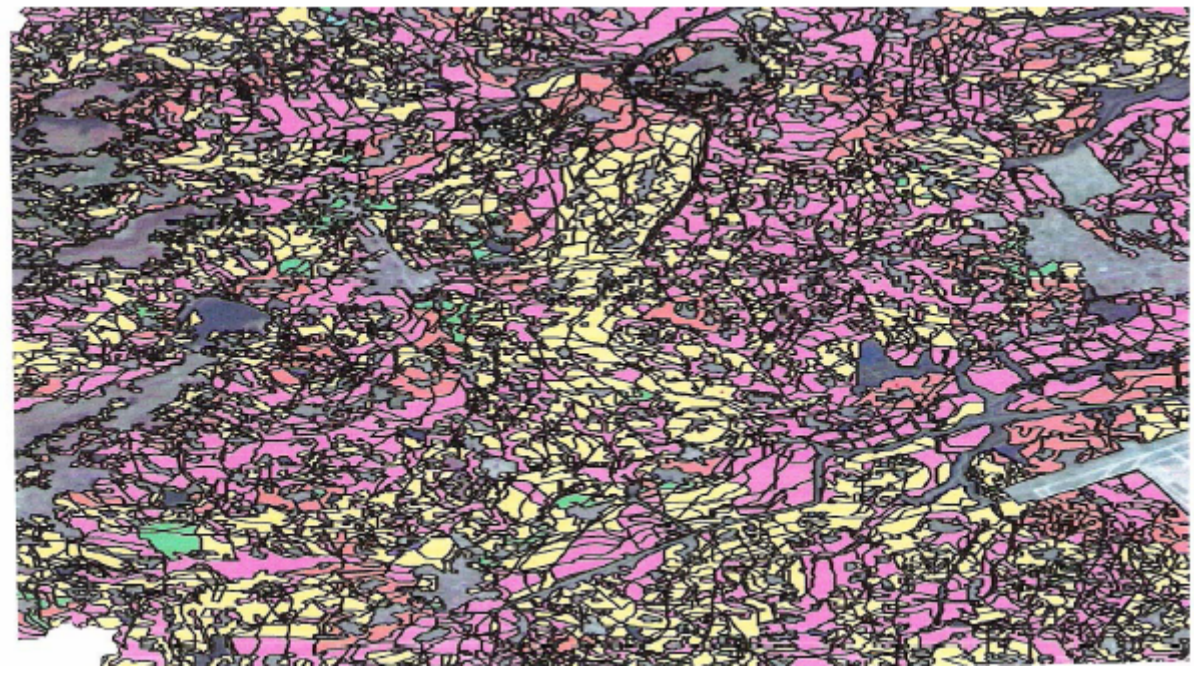


***Figure 4**: Enlarged Cut From Map 3 (to illustrate the great diversity of socio-ecological situations appearing even in a comparatively homogeneous landscape such as the flat plains of the Lower Yangtze reaches)* [5, 6, 7]

3 Effects of Projects

Nonlinearities and interdependencies of effects of projects are not yet sufficiently considered in methods of plan, programme and project evaluation, in particular the many non-linear appearances of effects and the non-linear forms of evaluation of the effects,

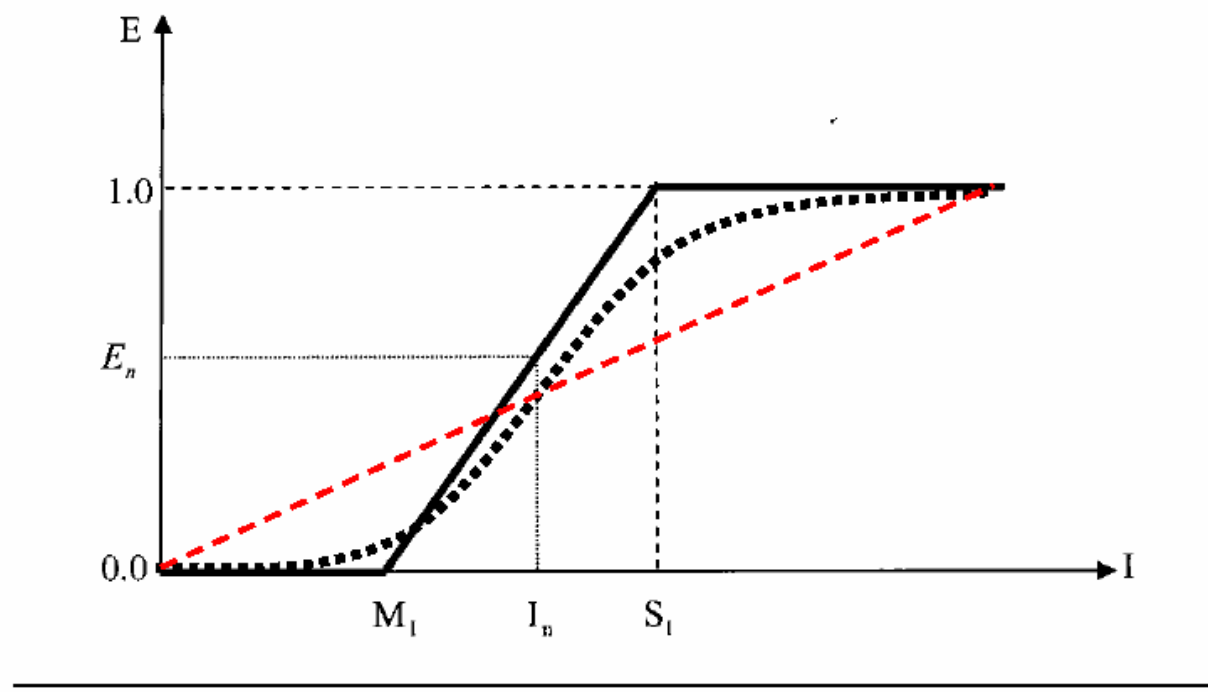


***Figure 5:** Evaluation of Infrastructure Projects (ΔI): Relation between Level of Investment S and Decision-relevant Level of Goal Achievement E*

Figure 5 presents in a schematic way (a) the prevailing general assumption of a linear relation between inputs and outputs (the interrupted red line), (b) the more realistic assumption of an S-shaped relation (dotted black curve) which expresses the trivial knowledge that very small investments (e.g. the number of hospital beds) may have very little, or even no effects, while towards reaching the desired maximum the marginal increase of effects has a tendency to become very small, and (c) a practical adaptation of the dotted black line into a twice broken full black line where **M_I** is the (normatively) defined Minimum and **S_I** the (normatively) defined "Standard" to be reached through development projects (investments). In this way any ***ΔI*** in the relevant space (from a little less than **M_I** to a little more than **S_I**) would have its particular gradient expressing the assumed non-linearity. Such an approach can be handled provided the experts in all fields competing for investments agree on the field-specific values of **M_I** and **S_I**.

In the Xuzhou Project [9] the approach could be applied, however requiring a tremendous (one-time) input of (available) expertise from all fields (in the Xuzhou case 16 fields of infrastructure investments competing for a limited amount of funds). In the Xuzhou case the overall effect of making use of such an approach which relied exclusively on the knowledge

available from experts and analysed the competing (potential) sub-sets by means of optimisation procedures (as fully explained by Samaniego) produced an estimated added value of about 100 billion Chinese Yuan RMB (~ 10 billion €) and provided a clear structure of time priorities (investments to be financed during three subsequent 5-Year-Plan periods; Figure 6) [9].

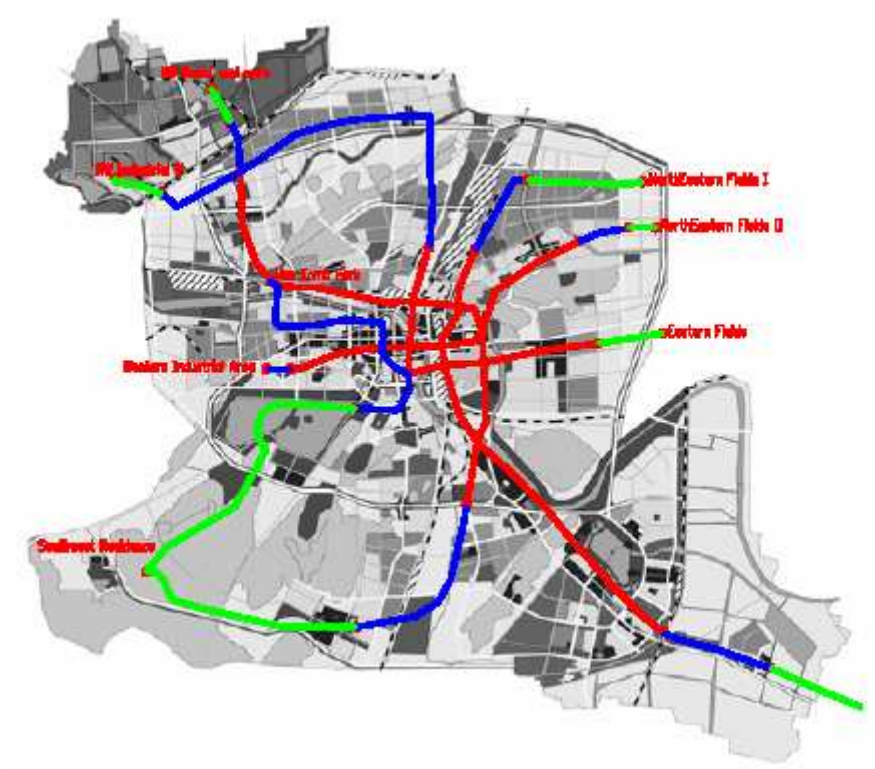


***Figure 6**:*
Time Structure of Investments in the Sector of Rail-based Public Passenger Transportation (red = during the Present plan period 2006-2010, blue = during the next plan period 2011-2015 and green = during the period 2016-2020) [9]

Similarly, the fact that the size (value) of many effects depends on the situation(s) and / or on the measures carried out in other sectors and / or in other (neighbour) regions can be formalised, on the basis of available knowledge (estimates).
Of course, the establishing of such information and analytical bases, including the fundamental research on investment-effect relations and the necessary improvement of evaluation (and in particular optimisation) methods, requires considerable efforts, personnel and funds. But societies must learn, and must be taught by ourselves first, that such funds must be made available just as societies have learnt (in the easier, because directly visible fields of technical projects) that the engineering costs of a bridge or a dam may reach 5 or even more per cent of the estimated construction cost.

What is needed is much more real world based empirical research as a basis for developing and testing more adequate evaluation methods. Unfortunately, there is no hope that such research may be funded in the Western countries in the near future. Must we assume, as shown by the Xuzhou example, that "new countries" such as China are more ready to invest into research on their future ???

4 Information

Finally I wish to draw attention to the tremendous unsolved problems concerning planning- and development-relevant information. In fact we must state, despite much progress made in the various fields of statistics and data systems, and in particular in the techniques of information generation and information treatment, that still too little attention is given to *systematically* determine and standardise adequate systems of information for planning, programming and evaluation.

Although most (but not all) researchers devoted to regional development studies and policy are aware of the handicaps resulting from insufficient and inadequate information, we continue a way of "blind" use of available information or of "arbitrary" production of data responding to the specific objectives / purposes of our particular research by ourselves, assuming the responsibility for the "normative" character of all information most of the times only implicitly, without regard to its practical (political) meaning and possible consequences.

As an impressive new example of good data availability and excellent possibilities of presentation leading only to unaccounted possibilities of misinterpretation (and misuse) I refer to the German example of INKAR: To illustrate just one out of thousands of possible examples of potential "manipulation" I present two maps (on the following page) which are based on identical information (GDP/Persons of the Labour Force 2002 by counties). In the first case (Map 6) this information is presented in four equal distribution classes (each class containing the same number of cases), while in the second case (Map 7) it is presented in four equidistant classes, established by the software accompanying the data. It is quite obvious that the same information creates totally different impressions depending on the way of presentation.

***Map 6**: GDP per person of the Labour Force (2002) presented in four **equal distribution** classes* [*from INKAR 2004*, 10]

***Map 7**: GDP per person of the Labour Force (2002) presented in four **equidistant** classes* [*from INKAR 2004*, 10]

The conclusion is that "Independent Non-Governmental Data Authorities" (funded by government) must be created to provide equally reliable and interpretable information to all potential users. However, it must be assumed that such a step will only be taken if and when the academic world will provide enough convincing evidence of misuse: then politicians, administrators and other representatives of interests *might* agree to establish conventions of information and a "Fourth Column" of a democratically controlled system of balanced powers - when will this happen?

Conclusion

For the time being, the perspectives for reaching a more satisfactory state of Regional Science *with regard to real world challenges* are not really promising.
However, from the presently dominating dissertation- and conference-orientated approaches may and hopefully will emerge a new generation of scholars and researchers who take up the flags of early 20th Century social and economics scientists who accepted their responsibility for contributions not only to more and better understanding, but also to improving administrative and political decisions in the real world.

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