

 Supplementary files are available for this work. For more information about accessing these files, follow the link from the Table of Contents to "Reading the Supplementary Files".

# Interreg EU Programme: a new assessment approach

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## Introduction: The Objective of this Work

The objective of our work is first of all to evaluate the methodological approach of System Dynamics applied to Interreg programme issues. We wish to understand whether this community programme can be assessed differently from today. The work focuses on the implementation of a model designed according to the principles of system dynamics applied to the assessment of European Union's INTERREG III A, "ALCOTRA" programme (Latin Alps Cross-border Co-operation between Italy and France).

The aim is to employ this model as a Decision Support System proper, which can be usefully employed for *ex ante* analysis and subsequent outcome and impact assessment of the INTERREG ALCOTRA programme.

## I The Context

### I.1 European Union's INTERREG Programme

The EU Structural Funds aim to promote economic and social cohesion through the correction of regional imbalances and the active involvement of the various regions in development and reorganisation processes.

The European Regional Development Fund aims to support production and business competitiveness (of SMEs in particular), local economic development, technological research and development, the development of trans-European networks, environmental protection and improvement, and equal employment opportunities for men and women.

The specific objective of the Interreg, even of Interreg III, initiative is to ensure that no national border will be an obstacle to balanced development and to the integration of the whole European area. In particular, Section A of the programme *aims to promote cross-border co-operation between authorities in adjacent areas with the purpose of creating cross-border socio-economic centres through the implementation of joined regional policies for sustainable development.*

The programme on the one hand aims to promote the economic development of regions where the border between different countries may act as a 'barrier', and on the other hand to turn this specific weakness into a strength.

When referring to the evaluation process, this means that, upon programme completion, we will have to measure the socio-economic gap reduction between this region and the European situation in general, as well as to assess co-operation skills between the two cross-border areas.

### I.2 The Geographic Area Involved

As already mentioned, INTERREG ALCOTRA refers to the cross-border region between Italy and France. For *ex ante* analysis and monitoring purposes and in order to assess the programme results and impact, it would be exaggerated but also of little

use to consider a geographic area which extends along a border of over 500 km and features very different socio-economic conditions.

In order to match cross-border homogeneity with socio-economic and cultural homogeneity, the suggested solution is to subdivide the region into smaller areas, however big enough to record the effects of planned and implemented actions and, if possible, to measure the related impact. Hence, the following zones have been identified:

- Zone 1 – Departement de Haute-Savoie – Departement de Savoie - Regione Valle d’Aosta
- Zone 2 –Departement de Hautes-Alpes – Departement de Savoie - Province of Turin
- Zone 3 – Departement des Alpes-d’Haute-Provence - Province of Cuneo
- Zone 4 – Departement des Alpes-Maritimes - Province of Cuneo - Province of Imperia



As you can see, the Departement de Savoie has been considered to belong both to Zone 1 and Zone 2, and the Province of Cuneo to both Zone 3 and 4. As a matter of fact, these zones are developing cross-border collaboration and integration actions along different directions. Therefore, when assessing the programme impact, it is advisable to examine the picture of the four zones by including these two areas into both Zones. Conversely, for overall statistical analysis, these two areas have obviously been considered only once.

## **II The Model**

### **II.1 Reference Model**

The model has been developed based on the “Urban Dynamics” work by Jay.W. Forrester (1969). In particular, two elements of Forrester's approach have been employed: the division into areas and the use of the external environment as a reference frame.

The division into areas has already been described above.

Using the external environment as a reference frame means that all results and input variables in the model are not assessed in absolute terms, but as a percentage variation as described by Forrester (see item II.4).

The model has been implemented using Vensim Ple Plus 4.2a software.

## II.2 Initial Definitions

1. Within the above described zones, a **geographic reference unit** has been identified: e.g. the Italian province and the French department. Economic and social data on a regional scale are normally made available by national and local statistic sources. However, for a correct interpretation, data at least on a provincial level were deemed to be necessary in order to meet the programme requirements.
2. Therefore, five sectors (or macro-variables) have been identified to describe the economic and social situation: population, industry, labour market, tourism, and environment.
3. Within each sector, those variables deemed to correctly describe each sector have been defined. Some of these variables have been included in more than one macro-variable, because they were descriptors of and of significance for more than one sector.
4. Cross-border co-operation means the ability of two areas (in this case an Italian province and a French department) divided by a national border to co-operate on an economic and social level. Flows through which cross-border co-operation takes place in practice, are flows of people, goods, and services across the national border. On the basis of these flows, also the five macro-variables which describe cross-border co-operation have been identified, namely: cross-border tourism, cross-border crossings for business reasons, those related to the provision of personal services (e.g. training, health, culture), and commercial cross-border flows of goods and services.
5. The time span for historic data collection was then determined: 1980-2000.

## II.3 Experimental Data Collection and Verification of Initial Definitions

Data collection activities have been time consuming and difficult. Indeed, economic and social data are normally gathered and organised by different bodies and organisations depending on the type of data to be collected. Also, data are usually aggregated at a geographic level other than the provincial or departmental one. Further, data collection criteria are not always homogenous (for example between Italian and French bodies) and historic series are sometimes incomplete because of the lack of systematic surveys. Due to all these reasons, we could not find many of the data we were looking for. Also, it can be maintained that, until now cross-border co-operation has not been measured in any way. The reason being that statistical systems are still organised on a national level only.

## II.4 “Relativisation” of Collected Data

Collected data have been “relativised” using the external environment as a reference frame. In other words, each piece of data on a provincial level has been correlated to the corresponding national datum.

Example: from (unemployment percentage in the Province of Imperia) to (unemployment percentage in the Province of Imperia / unemployment percentage in Italy).

## II.5 System Indicators

Eight System Indicators have been identified to describe the economic-social situation: population, services to citizens, tourism, services for tourism, labour market, industries, services to industries, environment. Conversely, in order to describe cross-border co-operation, four indicators have been determined: cross-border tourism, crossings for business reasons, commercial cross-border flows, and use of cross-border services (e.g. health, cultural services, education).

Each indicator has been linked to a variable pattern or to more variables combined:

Population (density per square km); Services to Citizens (average between hospital bed % and % of physicians); Tourism (average between national and foreign % of guests present in hotels and campings); Services for Tourism (average number of beds available in hotels and campsites); Labour Market (% of people employed); Industry (Number of companies in the industrial sector); Services to Industries (No. of service companies); Environment (oxide emission average).

Cross-border tourism (guests from the neighbouring country accommodated in hotels, campings, and tourist villages), cross-border crossings for business reasons (number of people crossing the border on business), cross-border commercial flows (amount of goods crossing the border), use of cross-border services (number of people crossing the border to receive health, education, cultural services).

## II.6 From Experimental Data to Causal Chart

Historical data have been used to plot a causal chart, that is, to clarify the nature of links connecting the various system indicators. The model was then adjusted for concordance between model output and previously collected empirical data. This adjustment was achieved using adjustment parameters calculated by means of genetic algorithm methodology. The system was optimised with the use of genetic algorithms, thus minimising the deviation between real and simulated data.

Historical data were then included in the model using them as initial data.

## II.7 System Decisional Levers

The model described so far is a close model, namely a model allowing no outside “disturbances”. However, the end objective of this project is to create a Decision Support System, namely a tool that can be used to assess the effects of policies implemented under the INTERREG programme. In other words, we want to assess the effects of policies fostering cross-border co-operation.

Planned Interreg actions are going to affect the following variables:

- Efficiency of cross-border connections
- Cross-border language schools
- Bilingual cross-border mass media
- Extent of protected areas
- Participation in tourist/cultural events
- Re-population of abandoned small villages and physical recovery of historic hamlets, city centres, buildings, and monuments
- Opening of employment agencies working on a cross-border level
- Collaboration agreements between service providers (health, schools and cultural bodies)
- Mutual knowledge of service providers

## II.8 Progress Report and Conclusions

The project we are presenting here has not been completed yet. Two areas of investigation are still open:

- **Cross-border co-operation:** as mentioned in the previous paragraph, for cross-border co-operation simulation, data describing it need to be systematically collected.
- Another critical point is the one concerning the lack of data on the **French departement**. Most of these data (differently from those that measure cross-border co-operation) are available, although they often have to be aggregated again to make them homogeneous hence comparable with Italian data. The fact that “French” data have not been collected yet and used for the purposes of this project is simply due to the lack of time, forcing us to submit the model while the work is still in progress.

In addition, the lack of French data does not allow us to present the model output on a zone level. Indeed, as mentioned at the beginning of this abstract, each single zone includes both Italian (one or more) provinces and French departement (one or more). Since we do not have data about the French departement, for the time being we are forced to present the model output for each Italian province only.

Finally, since the issues involved are very broad, the model illustrated in the previous pages (even when completed) will have to be considered as a starting point for subsequent analysis of all Interreg issues. It will be open to the contributions of anyone who is interested in participating in our project.