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A NEW STEP IN CLUSTER POLICY EVALUATION IN THE BASQUE COUNTRY

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Evaluation is considered nowadays one of the key issues in cluster literature (Sölvell, 2008). The article develops a new approach to the evaluation of the cluster policy in the Basque Country. This way it contributes to the literature on evaluation with a new experience of definition of control groups and to literature on clusters with two case studies based on the Basque experience.

At the beginning of the nineties the Basque Government implemented a cluster policy based on the analysis by Porter (1990). There are nowadays eleven cluster associations supported by such policy and their evaluation has become a key issue to determine the extent to which this policy is being efficient and how it should evolve in the future.

The article summarizes various evaluation processes developed up to now using different theoretical approaches. One of the main weaknesses detected is the absence of comparative studies of supported and non supported firms. Consequently, an empirical study is developed to overcome this gap. After a critical analysis of the conclusions, the authors propose participatory evaluation as the next step in order to improve the evaluation process.

UN NUEVO PASO EN LA EVALUACIÓN DE LA POLÍTICA CLÚSTER EN EL PAÍS VASCO

(Hoy en día la evaluación está considerada como uno de los elementos clave en la literatura sobre clústeres (Sölvell, 2008). Este artículo desarrolla un nuevo enfoque para la evaluación de la política clúster en el País Vasco, contribuyendo a la literatura sobre evaluación con una nueva experiencia de definición de grupos de control y a la literatura sobre clústeres con dos estudios de caso basados en la experiencia vasca.

A principios de la década de los noventa, el gobierno vasco implantó una política clúster basada en el análisis de Porter (1990). Actualmente existen once asociaciones clúster apoyadas por dicha política y su evaluación se ha convertido en un elemento clave para determinar el grado de eficiencia de la política clúster y cómo debería desarrollarse en un futuro.

El artículo resume los diferentes procesos de evaluación que han sido desarrollados hasta ahora, usando distintos enfoques teóricos. Una de las principales debilidades detectadas es la ausencia de estudios comparativos sobre empresas apoyadas y no apoyadas por lo que se desarrolla un estudio empírico para solucionar esta brecha. Tras un análisis crítico de las conclusiones, los autores proponen la evaluación participativa como el siguiente paso para mejorar el proceso de evaluación.

BESTE URRATS BAT EAEn KLUSTER POLITIKA EBALUATZEKO BIDEAN

Gaur egun, klusterrei buruzko literaturan ebaluazioa da elementu gakoetako bat (Sölvell, 2008). Artikulu honetan Euskal Autonomia Erkidegoko kluster politika ebaluatzeko ikuspegi berria proposatzen da. Horrela, ebaluazioaren literaturari kontrol taldeak definitzeko esperientzia berria eskaintzen zaio eta klusterren inguruko literaturari EAEko esperientzian oinarritutako bi kasuren azterketa.

Laurogeita hamarreko hamarkadaren hasieran, Eusko Jaurlaritzak kluster politika jarri zuen abian, Porterren azterketa oinarri hartuta (1990). Gaur egun, politika horrek 11 kluster elkarte laguntzen ditu eta haren ebaluazioa elementu gakoa da kluster politikaren efizientzia maila jakiteko eta etorkizunerako ildoak finkatzeko.

Artikuluak orain arte egindako ebaluazio prozesuak laburtzen ditu, hainbat ikuspegi teorikotatik ondorioztatu direnak. Aurkitutako ahultasun nagusietako bat da kluster politikak lagundutako enpresen eta kluster politikaren laguntzarik gabeko enpresen bilakaeran azterketa konparatiborik ez dagoela. Horregatik, lan honetan tarte horri irtenbidea emateko azterlan enpirikoa egin da. Ondorioen azterketa kritikoaren ostean, egileek ebaluazio parte-hartzailea proposatzen dute, ebaluazio prozesua hobetzeko hurrengo urratsa egiteko.

1. Introduction[1]

During the last two decades cluster policies have become a significant tool for policy makers at a regional level. They have implied a shift of focus from individual firms to local/regional systems of firms and other agents created to support them. Local agglomerations of SMEs have been analyzed with interest and development agencies have concentrated on endogenous growth processes instead of trying to attract investments from outside their region. In this context, the relevance of trust based interactions has been recognized. This shift has underlined the role of regional authorities as facilitators for companies and between these and the knowledge infrastructure (OECD, 2000, 2007; Cooke et.al., 2007; Cooke and Piccaluga, 2006; Cooke, 2004; Martin et.al., 2006).

The Basque Country was one of the pioneer regions to apply Porter´s methodology to detect potential clusters. Based on that, a cluster policy was defined which has resulted in eleven cluster associations assisted by the Industry, Trade and Tourism Department of the Basque Government. Sound analysis of the process has already been developed (Cooke and Morgan, 1998; Ahedo, 2004). The article aims to build on these contributions (see also Aranguren and Navarro, 2003; Aranguren et.al., 2006,2008; Iturrioz et al., 2006), analyzing how the policy has been evaluated up to now and taking a new step forward.

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More specifically, it analyzes what has been done in the field of evaluation of the cluster policy in the Basque Country up to now to take a step further by the comparison of assisted and non assisted firms. This way the article contributes to the literature on cluster evaluation adding one more case study related to cluster organizations and specifically developing a methodology to introduce control in the evaluation process (Sölvell, 2008).

Evaluation processes developed up to now for the cluster policy of the Basque Country are presented in Section 2. Section 3 focuses on methodological aspects and is divided in three subsections. The first one shows the main theoretical approaches on which the article is based. The second contrasts these approaches with the evaluation efforts made up to now for the cluster policy of the Basque Government, so that some gaps are detected. The third subsection develops a new methodological approach oriented to closing one of the detected gaps (the need to compare associated and non associated firms). This is done for two associations, the Paper Cluster Association and GAIA, the Electronics, Computer and Telecommunications Cluster Association. Section 4 presents the results obtained after applying the new approach and Section 5 closes the article with the main conclusions.

2. Cluster policy and its evaluation in the Basque Country

Although other similar concepts had been developed by the beginning of the 1990 decade, Porter´s (1990) definition of clusters spurred the implementation

of cluster policies at national and regional level. The Basque Country was one of the pioneer regions in doing so. More than a decade later, evaluation of such policies has become a key issue (see also Learmonth et.al., 2003).

Efforts to evaluate the efficiency of the cluster policy in the Basque Country were made in 1998, when the Industry, Trade and Tourism Department of the Basque Government decided to carry out a reflection process about the policy. What had been designed as a report evolved, following Ahedo (2004) towards a formed evaluation. Three main conclusions were obtained by this author from interviews with those involved in the process. The first conclusion was that it had been an adequate industrial policy in order to prioritise public resources. The second one was that there had been a low level of mergers and strategic alliances (which at that time where sought as a possible response to scarcity of big firms in the Basque Country), but an important increase in inter-firm relations. Finally, the associated firms were not inclined to finance on their own the whole budget of the cluster activities, and therefore public aid was still regarded as necessary.

Some years later, a new evaluation approach was developed by Aranguren and Navarro (2003). Based on its results a series of research projects have developed afterwards (see Aranguren et.al., 2006, 2008). Such projects, were defined by the authors in cooperation with the Department of Industry, Trade and Tourism of the Basque Government and some of the cluster associations.

The first approach to the evaluation of the cluster policy of the Basque Government made by the authors was an exercise to extract nine good practices from European studies on cluster policy and describe how such items had been considered in the policy process in the region (Aranguren and Navarro, 2003). One of the main conclusions at that time was that although direct effects of the policy were difficult to measure in terms of competitive upgrading, two positive effects were detected. First, the adaptation of other policies to the real needs of firms. Second, the improvement in the level of knowledge that firms had about public policies. The lack of evaluation in the policy process was also clearly detected.

Consequently, the next step was the application of an evaluation tool designed to measure the perception that the firms of the cluster associations had of the extent to which outputs (networking, social capital and cooperation in strategic projects) and results (improvements in firm competitiveness) were being reached.

The tool was applied to the Paper Cluster Association. This association is integrated by nineteen partners; mainly pulp and paper producers, but also suppliers of capital goods, engineering firms and a training center. Methodology and results of this evaluation project can be consulted in Iturrioz et al. (2006) and Aranguren et al. (2008).

Among other items, the degree of accomplishment of the mission shared by all cluster associations was measured. Such mission was stated as “improving

competitiveness through strategic projects in cooperation". Despite the difficulties derived from the vagueness in this definition (see Foley, 1992), some conclusions were obtained. Although 80% of the association members said that the activity developed in the association had influenced their competitiveness, only 10% said such impact had been high or very high and 60% said that it had been low, very low or none. On the other hand, 70% of the members said that the association had facilitated cooperation, generated trust and helped to share knowledge and experiences. So the association helped to develop social capital but had little impact on the competitiveness of its members. Two possible interpretations were presented then. The first one was that the mission of the cluster association was not fulfilled. The second that the mission can only be accomplished in the long term and intermediate goals were being reached in terms of social capital development.

3. Developing a methodological approach for the cluster policy evaluation process in the Basque Country

After this brief approach to conclusions of previous evaluation processes, this section presents the methodological aspects of the new evaluation exercise. First, the theoretical background is presented, then a description is made of how these concepts have been applied up to now to the evaluation of the cluster policy in the Basque Country. Finally, based on the gaps detected, a new methodological approach is proposed for the new evaluation project developed in the article.

3.1. Theoretical background

As Sölvell (2008) states, very different elements are considered when evaluating a cluster policy, as public interventions vary widely. Yet, however wide or narrow, long lasting or short lived, permanent or provisional, uniform or diverse, when evaluated they need to be described in some scheme of categories. It is essential that these portrayals do not render the interventions too idiosyncratic and situation bound. Various proposals for categorization are presented in this section on which the empirical part has afterwards been based.

Turok (1990) identifies four different approaches to policy evaluation. The first one is the internal review, based on administrative effectiveness. It basically monitors the effectiveness of programmes in allocating resources and achieving targets set internally. In this case, the primary concern is to measure performance of the inputs in delivering outputs rather than the measuring the effectiveness of the policy in terms of economic effects. The second one is external review, focused on financial efficiency. It again places its interest in the efficient use of the public resources, rather than in their effectiveness in generating the desired economic outcomes. But this time performance is measured by relating policy outputs more directly to resource inputs. The third one is the social accounting approach, in contraposition of the previous approaches, it concerns primarily about the effectiveness in terms of the economic and social outcomes of the policy, and not in the immediate outputs or in the performance of the financial cost, measuring real contribution to the

community. The fourth one is the understanding and explanation approach, that aims to obtain a deeper understanding of how policy works, going beyond the policy impacts and exploring how and why they are produced. This approach should look into the processes of economic growth and change and the forces and mechanisms which induce them.

One decade later, Raines (2002) presents the process of the cluster policy as a series of interlinked transformations: initial *inputs* go into the programme, the programme generates *activities*, from these activities direct *outputs* of policy support are derived, the immediate *results* of the support within immediate beneficiaries follow and finally, the *impacts* of policy assistance taking into account direct and indirect beneficiary contexts are produced.

In this approach, the conversion of inputs into policy activities and those into a series of outputs takes place within the policy agency and its delivery operation. However, the transformation of outputs into results and the transformation of results into impact takes place outside the policy delivery system.

Therefore, policy evaluation is concerned with all these transformations and has two roles. Its formative role addresses the efficiency of policy, analyzing how policy converts its various inputs into activities and outputs within the parameter targets set by its designers. The summative function of evaluation is concerned with the effectiveness of policy actions, measuring whether they have had a significant effect on its target groups (through its results) and on the wider economy (through its impacts).

Storey (2000, 2004) proposes a methodology for evaluating the impact of public policies to assist the small business sector, named the “Six Steps to Heaven”. In its approach, Storey differentiates between monitoring (from step 1 to 3), which relies exclusively upon the views of the recipients of the policy, and evaluation (from step 4 to 6), which seeks to contrast these views or actions with those of non-recipients in order to present the counter factual The difference between actual changes and the counter factual is viewed as the impact of the policy or its additionality.

The first step (take-up schemes) identifies the characteristics and nature of the take-up of the scheme. The data used in the first step are primarily collected by the public sector for accounting purposes. Their sole concern is to document expenditure and serve for accounting and legal functions but plays no economic role. In the second step (recipient’s opinion) firms who have participated in the scheme are asked for their opinion, trying to obtain their viewpoint both on the effectiveness of the scheme and its accessibility. In the third step (recipients view of the difference made by the assistance) recipients of the policy are also asked whether they think this made any difference to their firm’s performance. An important handicap of the second and third steps is that it is directed only to the beneficiaries of the policy, and no to all potential beneficiaries.

The next three steps are considered as evaluation. The fourth step (comparison of the performance of the assisted and typical firms) makes an inference supposing that any difference in the group of recipients and non-recipients of

the policy can be attributed to the impact of the policy. The problem of this step is that firms that receive assistance may not be typical firms in the economy as a whole. In the fifth step (comparison of match firms) researchers identify a specific control group (size, sector…) with which to compare the assisted businesses. Again, as in step 4, the inference made is that any differences in performance between the two groups are attributable to the policy. The problem is that the control group generally is constructed as part of the evaluation procedure and it is difficult matching upon all criteria simultaneously. Additionally, even if the matching characteristics are held constant, there may be other factors in which the two groups differ. The last step seeks to compare assisted and matched firms, considering the sample selection bias. Storey concludes that from the research community point of view, it is important to undertake the most sophisticated analysis possible.

3.2. Methodological approaches to the evaluation of the cluster policy of the Basque Government up to now

In Section 2 the previous evaluation projects developed by the authors have been presented. In this section they are analysed in terms of the frameworks just mentioned. This way, evaluation goals that have already been reached are delimited and a proposal is made on which should be prioritised now.

The first of the projects developed by the authors related to the cluster policy of the Basque Government was based on nine good practices and their descriptive contrast. This could not be considered as an evaluation process in

terms of Turok (1990, 1991), Raines (2002) or Storey (2000, 2004). It was a preliminary study that made it possible to focus the next research questions.

The second project, focused on the evaluation tool applied to firms in the paper cluster corresponds with the external evaluation approach proposed by Turok (1990), because the goal was not just output oriented, but intended also to measure the results obtained by the firms conforming the cluster association.

In the policy process presented by Raines (2002), the internal approach of Turok (1990) corresponds with the formative type of evaluation; and the external evaluation corresponds with the evaluation of the results in the summative type of evaluation. That means that up to now efforts have focused on the summative evaluation, without incorporating the formative point of view to the process.

Following Storey (2000, 2004), both the internal evaluation process developed by the Basque Government in terms of planning and budget control and the evaluation project developed by the authors can be cataloged as monitoring, but not evaluation. More specifically, the planning and budget control processes would be related to STEP I, where characteristics and nature of the take-up of the scheme are identified. And the evaluation project developed by the authors is related to STEP III, as the process relies exclusively on a survey where opinions of the recipients of the policy where collected.

It can be concluded that the cluster policy evaluation processes developed by the authors up to now has reached STEP III. The challenge now is going through steps IV, V and VI. That means that performance of the assisted firms should be compared with the performance of non assisted firms, that the control group of non assisted firms should match the assisted ones and that the selection bias should be considered. These have been defined as the goal of the empirical analysis presented in the article.

Finally, the absence of formative evaluation detected following Storey has not been prioritized in the research project considering that it will be better considered in the context of the internal evaluation process developed by the Basque Country in parallel to this research.

3.3. A new methodological proposal

Although the general goal of the project is trying to understand whether the existence of a cluster association improves the performance of associated firms, a more specific goal has been established from a methodological point of view: to compare the performance of assisted firms with a control group of non assisted ones, which is something new up to now regarding this policy. An special effort has been made in this experimental design to avoid sample selection bias.

The evaluation process has been applied in two cluster associations: the Paper Cluster Association (PCA) and the Electronics, Computer and

Telecommunications Cluster Association (GAIA). The Basque Paper Cluster Association, created in 1998, is an association of Basque pulp and paper firms which have joined forces to improve the industry's competitive edge. Partner companies (around 20) include pulp and paper mills, suppliers of capital goods, engineering firms and a training center. The actions carried out by the Cluster include co-operative projects in the areas of Quality and Management, Internationalization, Environment and Technology. GAIA is the Association of Industries for Electronic and Information Technologies in the Basque country, a non-profit, private and professional entity, created in 1983, which currently comprises near 200 companies which offer products and services in electronic, IT and telecommunications fields. GAIA's mission is to drive development and the growth of the Electronic, IT and Telecommunications sector and to favor the incorporation and efficient application of sector technologies with the aim of collaborating in the development of the Information and Knowledge Society.

The evaluation process focuses on the three main areas defined by the cluster policy as priority ones: technology and innovation, quality management and internationalization. Consequently, the indicators selected and measured for both groups of firms (assisted and non assisted) are the following:

a) Level of cluster associacionism in the natural cluster
b) Level of SMEs representativeness in the Cluster Association
a) Economic results (ROA)
b) Level of internationalization (percentage of sales in foreign countries and whether the firm has at least one plant in a foreign country or not)

c) R+D investment (whether the firm does R+D investment or not)
d) Level of quality certificates (whether the firm has a ISO9000 or a ISO14000 certificate or not)

Several information sources were used for these analyses. Data for association level and representativeness were obtained from DIRAE (Economic Activity Firm Directory from the Basque Statistical Institute). SABI-Informa database was used to extract economic and financial data of firms. Internationalization indicators were obtained from CIVEX (Basque Industrial Catalogue of Exporting Firms) database. For R+D analyses data from the Basque Statistical Institute R+D survey was used. Finally, quality and environmental certificates data was obtained from the Firm Quality Certifications Database of the Basque Government.

The main methodological difficulties met by the authors in this project have been the boundary definition, reaching significant samples of matched firms and impossibility of deriving cause effect relationships between the policy and firm behavior.

The boundary definition presented two main problems. On the one hand, the delimitation of the non assisted group of firms. Firms nowadays included in the cluster associations have such status because of two possible reasons. When the policy was implemented some of them were part of an existing group of interconnected firms and had already a collective structure (for instance a sector association). These structures assumed additionally the role of a cluster

association. Some others had connections with the Basque Government and were chosen as interlocutors for the process. That is why there is no clear criteria why some firms within a determined activity sector are in the cluster association and others with the same activity are not.

On the other hand, clusters do not fit into existing industrial and statistical classifications and there is a need to define the boundaries of the clusters to be examined by evaluators. There are two ways to handle this difficulty, to determine which activities and firms are part of the natural cluster existing before the cluster policy was implemented or to allow the cluster to be self-defining. This second option means that instead of imposing identity on the collectives, membership is established by mutual recognition. For the process applied in this research, both have been combined in two consecutive steps.

First, CNAE (National Classification of Economic Activity) codes of the associated firms were detected and a value chain of the cluster drawn. The scheme was contrasted with the Directors of the Associations, so that they could add or eliminate CNAEs to adjust the definition of the cluster to the real situation. After that, lists with all firms in the selected CNAE codes where prepared and again contrasted with Directors of the Associations. This way lists of potential cluster members were elaborated for each Association. The complete lists where used to analyze the extent to which firms that according to their activity could be associated, were so. For the comparative analysis, the sample of non associated firms was composed exclusively by firms with the

same CNAE as the associated ones in order to have matched groups of firms as proposed in Storey STEP V and VI.

Reaching significant samples of matched groups has been another methodological difficulty. As it has already been argued, it was necessary to conform match groups following size and CNAE criteria (CNAE means “Clasificación Nacional de Actividades Económicas” and is the Spanish Economic Activities National Classification). Anyway, some of these groups were too small for a significant analysis, so they have been aggregated by sector or size to solve the problem. This has reduced matching quality. That is why the CNAE classification used to compare assisted and not assisted firms is two digits level.

Finally, although the firms compared are located in the same territory (all are located in the Basque Country), have the same size and activity sector, it cannot be assumed that there are no other significant factors besides belonging or not to the cluster association that might influence economic and financial results, internationalization, R+D and quality certificates. That is why although the process gives an interesting insight on the subject, no cause-effect relationships can be established between the policy and performance of firms.

4. Results of the evaluation process

The following sections reflect the results of the evaluation process developed using secondary data, which have been afterwards contrasted with the Directors of the two cluster associations analyzed.

4.1. Evaluation results: the Paper Cluster Association

The first of the measured items has been the extent to which firms in the natural cluster (associated and potential members) are part of the association. The natural paper cluster in the Basque Country has approximately 1% of the total employment of the region. Only 20% of the employment of the natural cluster corresponds to associated firms. Considering that the CNAE activities analysed match quite reasonably the activities of the cluster, this means that there is a significant amount of potentially associated firms that actually are not so. Data about associated an non associated firms has been presented in Table 1 in the Appendix.

When CNAE activities of the associated and potential firms are analysed, a clear concentration of firms is detected in the paper producers in the case of the associated firms and in editing and graphic arts in the case of the non associated. Considering that the rest of the CNAE activities have been classified by the association Director as linked to the value chain of paper production, it can be concluded that the cluster association has developed on a very reduced part of the value chain. That is why, considering potential partners, diversity in the cluster might be classified as low. That might be

diminishing collaboration opportunities that would improve the fulfilment of the mission of the cluster association.

Data on innovation, internationalisation, quality and economic results have been contrasted for firms with the same CNAE for two digits and the same size, which means not all potential firms have been incorporated to this comparison. The sample is described in Table 2 in the Appendix.

One of the first issues derived from the analysis of the firm sample is that member firms are as average, bigger than non member firms. For that reason, for every indicator, SSC (same size composition) values have been calculated. This means that the values for non members have been recalculated hypothesising they had the same size structure than association members. That is, giving every size band the weight it has in the case of member firms. This way it can be estimated to what extent the differences presented are attributable to the different size structure among members and non members (see row Total SSC in tables 4, 5, 6, 7 and 8). The conclusion is that a very small part of the difference in innovation, quality and internationalisation indicators between members and non members is explained by the size factor. Same activity composition (SAC) values could have also been calculated, but it has not been necessary as the sector distribution of the sample of non associated ones matches almost perfectly the distribution of the associated firms. It is important to consider to this respect that only data from non associated firms with CNAEs represented in the association has been used to make the comparison.

The indicator chosen as a first approximation to innovation, is whether the firms have or not R+D activities. The percentage of firms that do R+D is higher among the members of the cluster association (25%) that among the non member firms (9%). This conclusion can be maintained for both CNAE codes and even when firm size is considered (see Table 1).

Table 1. Paper Cluster. Percentage of enterprises with R+D, with ISO 9000 - ISO 14000 quality certificates and plants outside Spain among associated and non associated firms by CNAE and size

CNAE and size	Associated with R+D	Non associated with R+D	Associated with ISO	Non associated with ISO	Associated with ISO 14000	Non associated with ISO 14000	Associated with Plant	Non associated with Plant
21- Paper industry	15%	5%	69%	58%	38%	3%	15%	13%
29 – Machinery and mechanical equipment	67%	25%	67%	25%	0%	0%	100%	25%
Total	25%	9%	69%	52%	31%	2%	31%	15%
20-99 employee	13%	8%	62%	51%	25%	0%	50%	18%
More than 99 employee	38%	14%	75%	57%	25%	14%	13%	0%
Total	25%	9%	69%	52%	25%	2%	31%	15%
Total for SSC	25%	11%	69%	54%	25%	7%	31%	9%

Source: Eustat and Civex.

The first indicators chosen to compare firms in terms of quality is whether the firms have or not the ISO 9000 certificate. The percentage of firms with ISO 9000 is higher among members of the association (69%) than among non members (52%). This conclusion is applicable for CNAE 21 and 29 and for different firm size groups (see Table 1).

The second quality indicator is ISO 14000 (environmental quality indicator). Its analysis shows similar conclusions to those obtained when ISO 9000 was analysed. The percentage of firms with ISO 14000 certificates is higher among the members of the association (31%) than among the non member firms (2%). This conclusion is applicable for CNAE 21 and 29 and all size groups (see Table 1).

Regarding internationalisation of firms, the percentage of exports over sales has been analysed. The ratio for association members is higher than for non members. As can be seen in Table 2, different export ranges have been defined and the member and non member firms have been classified according their percentage of exports on sales. If a line is drawn between those who export more and less than 16%, the percentage of firms that export more than that is higher among the members (81%) than among non members (25%). This conclusion is also valid for each CNAE (21 and 29) and each size group (20-99 employee and more that 99 employee).

Table 2. Paper Cluster. Distribution of firms according to their exports for associated and non associated firms by CNAE and size

	Associated							Non Associated						
CNAE and size	No export.	<5%	5-15%	16-25%	26-50%	51-75%	>75%	No Exp.	<5%	5-15%	16-25%	26-50%	51-75%	>75%

21- Paper industry	23%	0%	0%	15%	38%	15%	8%	42%	18%	13%	3%	11%	11%	3%
29- Machinery and mechanical equipment	0%	0%	0%	0%	0%	0%	100%	50%	13%	25%	0%	0%	0%	13%
Total	19%	0%	0%	13%	31%	13%	25%	43%	17%	15%	2%	9%	9%	4%
20-99 employee	13%	0%	0%	13%	25%	13%	38%	44%	21%	13%	3%	5%	10%	5%
More than 99 Employee	25%	0%	0%	13%	38%	13%	13%	43%	0%	29%	0%	29%	0%	0%
Total	19%	0%	0%	13%	31%	13%	25%	43%	17%	15%	2%	9%	9%	4%
Total SSC	19%	0%	0%	13%	31%	13%	25%	43%	10%	21%	1%	17%	5%	3%

Source: Civex (2006)

The second indicator related to internationalisation that has been analysed is the percentage of firms that have a plant outside Spain. As can be observed in Table1, this percentage is higher among member firms (31%) than among non members (15%). This is so for the two CNAEs and for the two size groups too.

Finally, the difference in economic results between paper cluster association members and non members is analysed. In this case, the sample was quite small, since there was no data for some firms in the SABI database (see this sample in Table 3 in the Appendix). So results should be interpreted more carefully than the previous ones. For this analyses the indicator of economic profitability has been used, defined as operating results over assets.

In this indicator (see Table 3), cluster association members present worse results (5%) than non members (8%). This conclusion is consistent for the two CNAEs (21 and 29) and for firms with between 19 and 100 employees. The result is the opposite for firms with more than 99 employees.

Table 3. Paper Cluster. Economic profitability among associated and non associated firms by CNAE and size

CNAE and size	Associated	Non associated
21- Paper industry	6%	8%
29 – Machinery and mechanical equipment	2%	8%
Total	5%	8%
20-99 employee	4%	9%
More than 99 employee	6%	5%
Total	5%	8%

Source: SABI database.

Although conclusions will be presented in the final section of the article, data seems to show that the association might be influencing members to work on R+D, quality certifications and internationalisation, but this has not translated in better results. Anyway, it would be necessary to analyse data series to test if actual improvements on these indicators might bring more profitability in the future.

4.2. Evaluation results: GAIA Cluster Association

As in the previous case, the first step has been to analyse how many of the potential firms are actually associated. The sectors represented in the GAIA association make up for 5% of the total employment of the region. 25% of these employees correspond to firms associated to GAIA. This means that there is an important number of firms that could hypothetically be associated but are not (see Table 4 in the Appendix).

In contrast with the results obtained for the paper cluster association, the diversification level is much higher in GAIA, as associated firms distribute in

every sector linked to the association. Not all activities have the same presence though, commercial activities being one of the most underrepresented.

Regarding the size of the associated firms, 74% of them have fifty or less employees. Anyway, the firms that are better represented in the association are the medium and big ones, with 24% and 25% of the natural cluster firms associated, while only 16% of the small ones are so.

Following the same procedure presented for the paper cluster, associated firms and non associated firms in the contrast group have been compared in terms of R+D, internationalisation, quality and economic results. Comparisons have been made between firms in the same CNAE for two digits and same size.

Again, SSC values of indicators have been calculated. These show the values of such indicators for the same size structure (results obtained assigning the size structure of member firms to non members). The conclusion again is that differences in innovation, quality and internationalisation indicators are not attributable to such effect. In this case, SAC (same activity composition) values were also calculated. Again, no significant differences are detected.

R+D as an indicator of innovation capacity has been contrasted first. Details can be seen in Table 4. The percentage of firms with R+D activities is higher among the members of cluster association (59%) than among non member firms (15%). This conclusion is applicable for every activity sector analysed and every firm size.

Table 4. GAIA. Percentage of enterprises with R+D among associated and non associated firms by CNAE and size

	Associated with R+D	Non associated with R+D	Associated with ISO 9000	Non associated with ISO 9000	Associated with Plant	Non associated with Plant
31- Electrical machinery and material	77%	34%	85%	61%	69%	86%
32- Electronic material	67%	24%	73%	21%	67%	91%
33- Precision equipment and others	78%	50%	56%	17%	89%	83%
45- Construction	17%	8%	33%	34%	100%	99%
51- Wholesale	44%	0%	33%	0%	67%	100%
52- Retail	50%	14%	0%	14%	100%	100%
64- Post services and telecommunication	50%	3%	33%	3%	100%	100%
72- Computing activities	59%	13%	16%	4%	98%	99%
1-9 employees	31%	7%	14%	1%	97%	100%
10-19 employees	64%	15%	18%	19%	95%	97%
20-40 employees	67%	24%	50%	27%	83%	95%
50-99 employees	80%	30%	50%	45%	90%	92%
100-249 employees	100%	35%	71%	42%	86%	88%
More than 249 employees	87%	31%	100%	35%	38%	88%
Total	59%	15%	37%	14%	88%	97%
Total for SSC	59%	20%	37%	15%	88%	95%
Total for SAC	59%	19%	37%	20%	88%	96%

Source: Eustat and Civex.

To measure firm performance in terms of quality, the percentage of firms with ISO 9000 certificates has been compared. That percentage is higher among the members of the cluster association (37%) than among non members (14%). But a closer look at Table 4 shows that this conclusion does not apply for every activity sector and firm size. The exceptions are CNAE sectors 45 and 52 and firms with 19-100 employees and under 10 employees.

Environmental quality in this activity is not as critical as it was in the case of the paper producers, that is why there are almost no ISO 14000 certificates. The difficulty to reach comparable conclusions based on such scarce data has led to the decision to leave this indicator out of the study.

Regarding internationalisation of firms, first we analyse the percentage of export over sales. As can be observed in Table 5, members export percentage is higher than non members one. This conclusion is valid for all CNAEs except 33 and every firm size group.

Table 5. GAIA. Distribution of firms according to their exports for associated and non associated firms by CNAE and size

	Associated							Non Associated						
	No export.	<5%	5-15%	16-25%	26-50%	51-75%	>75%	No Exp.	<5%	5-15%	16-25%	26-50%	51-75%	>75%
31- Electrical machinery and material	46%	0%	31%	0%	15%	8%	0%	55%	9%	13%	14%	5%	3%	1%
32- Electronic material	47%	13%	13%	13%	13%	0%	0%	68%	9%	6%	3%	9%	3%	3%
33- Precision equipment and others	44%	0%	11%	11%	33%	0%	0%	33%	0%	33%	17%	0%	0%	17%
45- Construction	83%	17%	0%	0%	0%	0%	0%	96%	0%	1%	1%	1%	0%	0%
51- Wholesale	67%	0%	0%	22%	11%	0%	0%	90%	10%	0%	0%	0%	0%	0%

52- Retail	100%	0%	0%	0%	0%	0%	0%	100%	0%	0%	0%	0%	0%	0%
64- Post services and telecommunication	83%	0%	0%	0%	17%	0%	0%	100%	0%	0%	0%	0%	0%	0%
72- Computing activities	94%	2%	0%	0%	2%	2%	0%	99%	0%	0%	1%	0%	0%	0%
1-9 employees	97%	0%	3%	0%	0%	0%	0%	99%	0%	0%	0%	0%	0%	0%
10-19 employees	77%	9%	5%	0%	9%	0%	0%	94%	0%	0%	3%	2%	0%	1%
20-40 employees	63%	0%	13%	10%	10%	3%	0%	80%	3%	8%	5%	3%	1%	0%
50-99 employees	60%	20%	0%	0%	10%	10%	0%	74%	8%	8%	8%	2%	0%	2%
100-249 employees	57%	0%	14%	14%	14%	0%	0%	77%	0%	4%	8%	4%	8%	0%
More than 249 employees	50%	0%	0%	13%	38%	0%	0%	77%	12%	4%	8%	0%	0%	0%
Total	75%	4%	6%	4%	9%	2%	0%	92%	2%	2%	2%	1%	0%	0%
Total for SSC	75%	4%	6%	4%	9%	2%	0%	84%	3%	5%	4%	2%	1%	2%
Total for SAC	75%	4%	6%	4%	9%	2%	0%	90%	2%	3%	3%	1%	0%	0%

Source: Civex (2006)

The percentage of firms with a plant outside Spain has also been analyzed as an indicator of internationalization. Data in Table 4 show that this percentage is higher for associated firms than for non associated ones. The conclusion is true for all CNAEs studied, except CNAE 45 and 33.

Economic results have been analysed in this case as in the previous one. Various sectors showed negative values, that after interviews with firms in the sector seem to be due to the consideration of R+D as an expense and not investment by some of the firms. As R+D is relevant in this sector and it was not possible to isolate this effect, such data has not been used to compare associated and non associated firms.

5. Conclusions

After almost two decades since the cluster policy of the Basque Government was defined following Porter´s methodology, various efforts have been made to evaluate the results obtained.

The first goal of the paper was to reconsider the evaluation processes developed up to now, to establish to what extent they respond to the most demanding approaches defined for evaluation models. This has showed several aspects that have not been considered in the previous processes, mainly the comparison between assisted and non assisted firms and the need to reinforce understanding and explanation approaches.

A step forward has then been taken by developing a new evaluation process in two cluster associations, the Paper Cluster Association and GAIA. Member firms of such associations have been compared with control groups in terms of three strategic areas for the cluster policy: innovation, quality and internationalisation. This way, one of the improvement areas detected previously in the evaluation process has been considered.

Data show that systematically in the Paper Cluster Association and with some exceptions in GAIA, firms belonging the cluster associations have better values in the innovation, quality and internationalisation indicators. No cause effect conclusions can be obtained though, as it is difficult to determine whether the associations have helped firms improve in these areas or firms with a higher performance profile joined the cluster association.

Economic profitability of associated and non associated firms has also been compared. In the Paper Cluster Association taken as a whole, non associated firms show a better performance, though in the segment of firms with more than 99 employees, associated ones are doing better. The general conclusion might be that associated firms have better performance in terms of the selected indicators for innovation, quality and internationalisation, but this does not involve they are more profitable.

The difficulties to derive clear conclusions from the evaluation process carried out is directly related to some of the characteristics implicit to clusters presented at the theoretical background: the mixture of tangible and intangible objectives; their systemic nature and the complexity of cause-effect relationships. It seems logical, thereby, to conclude that new methodologies should be developed to respond to the evaluation needs of these policies. Participatory evaluation has been the next step proposed by the authors for the Basque Country. A consensus approach to the definition of a set of indicators and their interpretation shared by policy makers (and their technical teams), technical teams at the cluster associations and firm representatives would be an important step forward in this policy evaluation process.

From a research point of view, this is coherent with the proposal made by Cooke (2007) that research must cease jumping to “policy implications” from theoretical modelling, a tradition that produces unrealistic advice to understandably sceptical policy actors. Rather implications should be subject to

“proof of concept” testing in negotiated stakeholders discourse to establish the appropriateness or otherwise of such “policy implications”.

With this in mind, a new research project has already been defined by the authors to develop a participatory evaluation process. It is based on the methodological approach proposed by Diez (2001, 2002), who has analyzed different methodologies for the evaluation of regional innovation and cluster policies and is applying some of them in the context of the Basque Country. She considers that attending to the specific characteristics of the cluster policies (the mixture of tangible and intangible objectives; their systematic nature and embeddedness; the complexity of cause-effect relationships and a bottom-up design and implementation), most of the methodologies used up to now to evaluate them are not adequate to face the challenges that these policies present. This approach provides an evaluating focus committed to the development of a change or improvement that is interactive, contextualized and directed to knowledge building. This way the challenge presented by Turok (1990) to incorporate the fourth evaluation approach, focused on understanding and explanation will be worked on.

Appendix

Appendix Table 1: Estimation of the natural cluster behind the Paper Cluster Association

	Clúster Association				Potencial members				Natural clúster (associated + potencial)			
	N. firms	%firms	Emplo	%Emplo	N. firms	%firms	Emplo	%Emplo	N. firms	%firms	Emplo	%Emplo
Total	16	100	2.007	100	498	100	7.558	100	514	100	9.565	100
By CNAE												
20- Wood and cork	0	0%	0	0%	1	0%	34	0%	1	0%	34	0%
21- Paper industry	13	81%	1.666	83%	94	19%	2.735	36%	107	21%	4.401	46%
22- Editing and graphic arts	0	0%	0	0%	366	73%	3.723	49%	366	71%	3.723	39%
24- Chemical industry	0	0%	0	0%	1	0%	15	0%	1	0%	15	0%
27- Metallurgy	0	0%	0	0%	2	0%	37	0%	2	0%	37	0%
28- Metallic products	0	0%	0	0%	4	1%	97	1%	4	1%	97	1%
29- Machinery and mechanical equipment	3	19%	341	17%	20	4%	613	8%	23	4%	954	10%
41- Water capturing, treatment and distribution	0	0%	0	0%	1	0%	130	2%	1	0%	130	1%
51- Wholesale	0	0%	0	0%	4	1%	37	0%	4	1%	37	0%
63- Activities attached to transport	0	0%	0	0%	1	0%	1	0%	1	0%	1	0%
74- Other business activities	0	0%	0	0%	3	1%	136	2%	3	1%	136	1%
By size												
1 a 9	0	0%	0	0%	287	58%	1.128	15%	287	56%	1.128	12%

10 a 19	0	0%	0	0%	120	24%	1.613	21%	120	23%	1.613	17%
20 a 29	1	6%	47	2%	61	12%	1.801	24%	62	12%	1.848	19%
50 a 99	7	44%	502	27%	19	4%	1.378	18%	26	5%	1.927	20%
More than 99	8	50%	1.458	71%	11	2%	1.639	22%	19	4%	3.097	32%

Sources : DIRAE database, SABI-Informa database and CIVEX database.

Appendix Table 2: Sample for innovation, internationalization and quality indicators analysis in the Paper Cluster Association

By CNAE	Members	Non members	Total	Members	Non members	Total
CNAE 21-Paper industry	81%	83%	82%	13	38	51
CNAE 29- Machinery and Mechanical equipment	19%	17%	10%	3	8	11
By size						
20-99 employee	50%	85%	76%	8	39	47
>99 employee	50%	15%	24%	8	7	15
Total	100%	100%	100%	16	46	62

Source: Authors' elaboration.

Appendix Table 3: Sample for Economic Profitability analysis in the Paper Cluster Association

By CNAE	Members	Non members
CNAE 21- Paper industry	12	33
CNAE 29- Machinery and Mechanical equipment	3	8
By size		
20-99 employee	8	35
More than 99 employee	7	6
Total	15	41

Source: Authors' elaboration.

Appendix Table 4: Sample qualification in GAIA

	Clúster Association				Potencial members				Natural clúster (associated + potencial)			
	N.firms	**%firms**	**Empl**	**%Empl**	**N.firms**	**%firms**	**Empl**	**%Empl**	**N.firms**	**%firms**	**Empl**	**%Empl**
Total	159		12.258		752		36.960		911		49.218	
Classified by CNAE	142	100%	8.184	100%	744	100%	36.665	100%	886	100%	44.849	100%

31- Electrical machinery and material	14	10%	1.096	13%	78	10%	5.599	15%	92	10%	6.695	15%
32- Electronic material	15	11%	1.595	19%	35	5%	1.702	5%	50	6%	3.297	7%
33- Precision equipment and others	9	6%	662	8%	6	1%	116	0%	15	2%	778	2%
45- Construction	6	4%	1.419	17%	75	10%	4.780	13%	81	9%	6.199	14%
51- Wholesale	9	6%	142	2%	13	2%	2.894	8%	22	2%	3.036	7%
52- Retail	6	4%	96	1%	7	1%	246	1%	13	1%	342	1%
64- Post services and telecommunication	7	5%	595	7%	40	5%	5.581	15%	47	5%	6.176	14%
72- Computing activities	51	36%	2.014	25%	488	66%	15.173	41%	539	61%	17.187	38%
Others (1)	25	18%	565	7%	2	0%	574	2%	27	3%	1.139	3%
Non classifiable by CNAE	17		4.074		8		295					
Classified by size	147	100%	12.258	100%	732	100%	36.360	100%	879	100%	48.618	100%
1 a 9	53	36%	262	2%	398	54%	1.357	4%	451	51%	1.619	3%
10 a 19	27	18%	379	3%	103	14%	1.517	4%	130	15%	1.896	4%
20 a 49	38	26%	1.197	10%	132	18%	4.290	12%	170	19%	5.487	11%
50 a 99	12	8%	862	7%	47	6%	3.411	9%	59	7%	4.273	9%
100 to 249	8	5%	1.237	10%	25	3%	3.765	10%	33	4%	5.002	10%
250 o more	9	6%	8.321	68%	27	4%	22.020	61%	36	4%	30.341	62%
Non classifiable by size	12						600					

(1) Others = CNAE (22+29+30+36+70+71+74+80+85+92)

Sources : DIRAE database, SABI-Informa database and CIVEX database.

Appendix Table 5. Sample for Economic Profitability analysis in GAIA

By CNAE	Members	Members (%)	Non members	Non members (%)
CNAE31- Electrical machinery and material	13	12%	77	11%
CNAE32- Electronic material	15	13%	34	5%
CNAE 33- Precision equipment and others	9	8%	6	1%
CNAE 45- Construction	6	5%	74	10%
CNAE 51- Wholesale	9	8%	11	2%
CNAE 52- Retail	6	5%	7	1%
CNAE 64 – Post services and telecommunication	6	5%	40	5%
CNAE 72 – Computing activities	49	43%	483	66%
By size				
1 to 9	36	32%	395	54%
10 to 19	22	19%	101	14%
20 to 49	30	27%	131	18%
50 to 99	10	9%	53	7%
100 to 249	7	6%	26	4%
More than 249	8	7%	26	4%
TOTAL	113	100%	732	100%

Source: Authors' elaboration.

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