The Role of Industry-oriented Cooperation for Sustainable Development

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Abstract

The influence of environment-oriented cooperation on innovations is an important factor for sustainable development. The paper outlines and analyses the impact of this factor, and especially focuses on the contribution environment-oriented cooperation towards realizing innovations. This phenomenon is explained by the identification of important innovation-relevant cooperation factors such as industry-orientation. Cooperation that is industry-oriented influences the implementation of environmental innovations, and thereby, sustainable development.

Keywords: Sustainability, environmental networks, environmental innovations

JEL Classification: O14, R19

1. Definition of environmentally-oriented cooperation

From a multitude of cooperation intents and purposes, different forms of cooperation have developed concerning environmentally-oriented cooperation. The desired outcome from such cooperation determines the form of cooperation chosen. These cooperation forms can be used within an industry sector, as well as, among various sectors, let us say, intersectorally. Often the environmentally-oriented cooperation among enterprises has been either interpreted as its market or society-oriented adaptation strategy or analyzed from the aspect of proactive ecological adjustment policy. Additionally, environmentally-oriented cooperation works as a means to obtain advantages in the market and over the competition. The diversity and range of environmentally-oriented cooperation extends from corporate enterprises to regional entities. Environmentally-oriented cooperation is comparable to classical cooperation because enterprises do not enter into this cooperation for ecological reasons, but rather, for economic ones. Therefore, environmentally-oriented cooperation is a comparable alternative to classical cooperation.

While the diversity of cooperation is reflected in the scope of the definitions that describe the phenomenon, there are only a couple which make a environment-related reference. From KUPP cooperation is: “any form of voluntary and conscious collaboration for the

achievement of common objectives" (...),"in which the cooperation partners remain legally and economically independent, whereas cooperation usually includes subareas of the task variety of the cooperation participants" [1]. For KRCAL, inter-company environmental protection cooperation is: "all forms of cooperation" which allow for "a common achievement generated for the realization of measures for environmental protection by two or more partners (supplier, end product manufacturer, waste management) with the objective to increase the environmental compatibility of the products" [2].
Diversity applies to the kind of participants (e.g. NGO, political entities and individuals, enterprises, etc.) involved as well as to the form of cooperation. Even so, most environmentally-oriented cooperation is among enterprises and/or other social or political participants. Public policy is also relevant for any environmentally-oriented cooperation. While the economic and social interests are considered by the enterprises, the solution to the ecological problems is incumbent not only upon the cooperation partners, but also, on the public through public policy.

Even without the development of an economic understanding of the term 'environmentally-oriented cooperation', the wide range of definitions shows the variety of ways in which an 'environmentally-oriented cooperation' can be formulated depending upon its precise objective and the context in which it takes place. However, there is a commonality in the diversity: each 'environmentally-oriented cooperation' aims at an environmental discharge or improvement. The substantiality of any cooperation relies upon certain characteristics; and additionally, an environmentally-oriented cooperation has certain fundamental, term-determining characteristics that must be present if it is to be called an 'environmentally-oriented cooperation'.

When the characteristics presented can incorporate the specifics of practical problems, while the opportunities and risks inherent to any environmentally-oriented cooperation are proportionally and fairly shown, then the definition contains exactly the term-determining characteristics necessary. Based on the definitions above, it appears that the fundamental characteristics of the cooperation term are accentuated differently depending upon the discipline [1, 3]. In order to examine the contribution of an environmentally-oriented cooperation to sustainable development, the cooperation must fulfill certain requirements such as: the inclusion of different participants or the development of environment relief

potential. Therefore, an environmentally-oriented cooperation is: "every form of voluntary and conscious cooperation between partners, each of whom represents a sector from the economic, political, and social spheres, in order to achieve common "win-win-oriented' aims, of course, with the assumption that the cooperation partners are legally and economically independent from each other." [4].

The creation of an environmentally-oriented cooperation not only strengthens the relations between an enterprise and the other entities, but contributes to the development of an improved economy, and/or to the promotion of competitiveness - all as a result of the partners' cooperative work done on environmental projects. The perspective of the implementation of sustainable development by an environmentally-oriented cooperation will be discussed in more detail in the following.

2. The role of environmentally-oriented cooperation for implementation of sustainable development

Sustainable development, which has gained prominence since the Rio World Summit in 1992 [5], grows increasingly important. The concept of sustainable development means: "development that meets the requirements of the present without compromising the ability of future generations to meet their own needs" [6]. Sustainable development can be regarded on three levels: as a political concept (locally, regionally, nationally, and internationally); as a normative-ethical concept (model); and as analytical concept [7]. Strategically, its aims are: an improved competitiveness; and an increased valuation of the environment and natural resources that promotes the former and protects the latter; and a perceived social responsibility that adheres to ethical social behavior [8; 9]. It is understood as integrative concept, too [10]. While there are substantial long-term changes in the economy and society, a fundamental change in the economic situation is required before more such consideration can be given. Even so, as more such solutions effect, after only a short time, the ecology, economy, and society, it is notable how the concepts of sustainable development have both gained respect and risen in importance.

For some years now, particularly when regarding environmental problems, discussions have revolved intensively around the concept of sustainability. Due to the global impact major environmental problems, such as climate change, have had, along with an increased

environmental awareness, combined with an intensified push for increasingly complex environmental legislation, the basic conditions for project development and fulfillment have continued to change for the better. These circumstances have pushed any re-orientation or freshly guided search for solutions into a prominent and favored role. Inherently, at the ecological roots of sustainability, is its dynamic, key role because as BAUMERT asserts, it is the "qua definition for holistic thinking and action model" [11]; so, therefore, it is particularly suitable for new impulses.

Innovation in environmental matters continues to gain prominence, particularly, when the challenges to be addressed are pro-ecological ones. This is especially evident in both the German and European economic and environmental policies [12], where, if the innovative measures are realized, there will be greater environmental protection and sustainability. Whereby, the environmental innovations will have played a major role. Such innovations are recognized in the reduced consumption of resources and a decrease in pollution [13, 14].

Not only should efficient and competitive solutions be sought, but also, social acceptance, because public opinion can be counted on to stimulate innovation projects, activities, among enterprises and the other participants. Co-operation, at this point, plays a decisive, important role for sustainable development. On the basis of sustainable development, enterprises are not only dared to cooperate (e.g. inter-company co-operation or "Public Private Partnership"), but also, to associate it with the opportunity for innovation or new markets [15, 16]. The promotion of cooperation among companies is necessary.

The research focus in this field is increasingly on those so-called sustainability networks [17] which claim sustainability while inconsistently considering sustainability in all its dimensions, and yet, which are rather more consistent when it comes to either the economic or ecological aspects. Due to the complexity of sustainability, it will be necessary and more appropriate to investigate this aspect of environmentally-oriented cooperation further on. Even as the role cooperation plays, increasingly realizes sustainable development, there are substantial gaps to be seen in overall awareness. The evaluation of cooperation, necessary to implement regional, national sustainability strategies, requires further clarification. Another question arises about the conditions relevant for the realization of sustainable development through cooperation. Even so, before the influence cooperation has had on the generation, implementation of innovation can be explained, further study is necessary.

3. Research design and methodology

In order to be able to assess the influence of cooperation on sustainable development, an empirical analysis has been conducted. This has allowed for the identification of the important characteristics and conditions. From the identification of these points, essential to the concept, it has then become possible to explain how an environmentally-oriented cooperation has been able to realize sustainable development and to identify the innovation-relevant, cooperation factors necessary to implement sustainability.

As science recommends increasingly, both the qualitative and quantitative research designs were used for the empirical study. After the qualitative outcomes were gathered, the information was validated quantitatively. The combination of both research methods gave the study an optimum vantage while the choice to use either one or the other alone would have failed to meet the research objectives and requirements [18].

The chosen qualitative research design makes an analysis that is based on various perspectives; the variety makes a better reconstruction of the subject. One environmentally-oriented cooperation was chosen for particular analysis. The case study focuses on a working group from the "paper and print" industry. Seven interviews are used in the case study. For the qualitative analysis, an environmentally-oriented cooperation network of the *"Industrieabfall-Koordinierungsstelle Sachsen"* (IKS) was selected; it is regarded as the most innovative and most successful example in the environmental sector (specially in waste management) in Germany [19]. An industry research group "paper and print industry" in the field of waste management, represented in the IKS network, was selected for the empirical research. It represents a successful and complex example of a cooperation along the value chain from the paper manufacture and printing industry up to disposal. Seven interviews form the basis of the empirical analysis, which were conducted both with enterprises and with scientific and political experts.

For the quantitative research, a questionnaire was established. This questionaire was sent to all members of the Environmental Association "Bundesdeutschr Arbeitskreis für Umweltbewusstes Management (B.A.U.M.) e.V." This case of cooperation represents one of the most well-known and largest environmental federations in Germany, and is, also, the largest environmental initiative of the economy in Europe [20]. Moreover, about 500

enterprises belong to this association with approximately 2,500 members. Altogether only 49 questionnaires were filled in, which approximates a return rate of 2% [4]. The low participation in the online survey is to be seen as critical. However, since the quantitative research was used as an additional instrument for validating the qualitative results, certain tendencies and recommendations can definitely still be deduced.

Overall, the selected cases of cooperation can support the research process from different perspectives of research; because on the one hand, they represent typical characteristics of environmentally-oriented cooperation, while on the other hand, they are regarded as appropriate cases due to the content as well as to the formal or structural criteria such as the combination of participants and industry diversity. Thereby, it is possible to confirm the qualitative results by an additional case of cooperation in order to increase the validity of the results.

4. Relevance of industry-orientation: Some empirical results

Because continual dynamics are characteristic of environmentally-oriented cooperations, the interaction between the enterprise and its environment are of a changeable nature. Notably, there are several factors that influence sustainable development.

The empirical analysis reveals that environment-oriented cooperation can unfold a variety of innovative capabilities. The exemplary cooperation characteristics such as different actors, coordination, and so on, can contribute to the generation and realization of environmental innovations in enterprises; however, characteristics alone cannot unfold any sufficient innovation effect. They always have to be regarded in interaction with other factors which are also outside of the sphere of influence of an environment-oriented cooperation, because the environmental innovations are not realized by cooperation alone [21]. Since not every cooperation is successful and innovation conducive, it was necessary to examine under which conditions an environment-oriented cooperation can be innovation conducive. In table 6 are emphasised the characteristics which were determined concretely from an industry-related cooperation case.

Tab. 1: Innovation-relevant cooperation characteristics and their derivative sources

Cooperation characteristics	***Derivative sources***
(1) heterogenouos constellation of actors	economy, politics, science
(2) professional know-how exchange	practical reference (plant visits, wide range of know-how, informal relations)
(3) professional coordination	multiplicator, moderator

(4) industry reference / added value chain	printing, paper industry, waste management

Source: According to URBANIEC (2008).

An industry reference is identified as one factor, and it is particularly so when dealing with the added value chain. This is one factor among other empirically relevant cooperation characteristics. Related to the position of the cooperation partners in the added value process, the *industry-related case of cooperation* exhibits at the same time, *vertical* (between the up and down stages of the added value chain, i.e. from the paper's manufacture and the printing, up to the disposal) as well as *horizontal* (between industry competitors at parallel levels of the added value chain, i.e. between the examined printing enterprises) tradeoffs. The industry cooperation case examined here is regarded as innovative by some actors due to its value chain exposure and activity. Some of the enterprises and experts interviewed emphasised that inter-sector cooperation is a better way to solve the internal environmental problems (e.g. questions involving environmental costs). By interaction between the up and down stages of the added value chain, internal and interplant improvements or organisational solutions can be developed. An interplant consideration expands the spectrum of industry-relevant processes and interdependent relationships. This broad focus facilitates the identification of activities for integrated solutions; also, the comprehensiveness found in the problem solving discussions makes it necessary. Inter-sector cooperation is found to make an essential contribution to sustainable development when the technological developments within the paper industry and its associated environmental problems are discussed intersectorally while including the down stages of the added value chain.

The importance of the industries along a value chain appears to be particularly relevant. This importance is related to the material or energy life cycles of the various technologies, products, or services. The recycling management from the raw materials production (paper manufacturing), to the production (printing) and utilization, up to the point of recycling or disposal of waste, when dealt with in the context of an exchange of information and the valuation of experience, opens up many potential opportunities for sustainable development.

In summary, *the industrial and value chain character* of environmentally-oriented cooperation facilitate, for example, the following:

- the discussion about the ecological, social, environmental, technological and market-related environment conditions;

- a targeted idea and solution search concerning the environmental aspects, which are necessarily associated with the different environment conditions mentioned above and lead to new technological and organisational solutions;
- many *synergy possibilities by an industry-related exchange of information* between the individual actors;
- the ability of the actors to solve problems and thus the realization of sustainable development.

With a closer inspection of inter-sector cooperation, it becomes apparent that among those interviewed, a great relevance is attached to the realization of environmental innovations. Therefore, sustainable development exist along the added value chain in both industry-referenced cooperation and in cooperation with partners (see table 1).

Tab. 2: Importance of the industry-orientation as a relevant cooperation characteristic (percentage and absolute)

Specification (importance)	***very important***	***relatively important***	***relatively not important***	***not important***
Industry-related cooperation	14 % (7)	31 % (15)	10 % (5)	0 % (0)
Intersectoral cooperation	12 % (6)	22 % (11)	22 % (11)	0 % (0)
Cooperation with partners along the added value chain	16 % (8)	31 % (15)	6 % (3)	2 % (1)

Source: URBANIEC (2008); remark for missing percentage: no answer.

It is interesting that intersectoral cooperation was mentioned by an equal number of those surveyed as either relatively important or relatively unimportant (in each case 22%). This result could be explained by individual prejudice towards one type of cooperation over another. There is more potential for support of sustainable development in industry-related cooperation (31 %) and in cooperation with partners along the added-value-chain (31 %). In summary, these results confirm the importance of industry-related cooperation with partners along the added value chain. It is a feature of cooperation to have a positive effect on both the realisation of innovations and sustainable development.

Altogether, it can be deduced that an environment-oriented cooperation between different actors which is concentrated on industry-specific (optimal: with reference to the added value chain) as well as oriented towards the interests of all actors, can clearly establish the potential of innovation. However, it is potential which is to be recognised and developed by the environment-innovative enterprises themselves.

5 Implications for sustainable management

Previously shown: Whenever an environment-oriented cooperation meets the requirements for an innovation implementation, it becomes possible for the cooperation to do so for sustainable development as well. The question now becomes: What is required to activate this "piggyback" effect?

It has to feature specific characteristics which concern both the actors and the actual process of cooperation. These can be observed only in interaction because it is a mutual effect. In general, the exemplary cooperation characteristics can be parameterized as follows:

- The *heterogeneity* of the cooperation participants promotes the development of cooperation. Cooperation among actors from business, science and politics enables access to varied expert knowledge, and by association with different expertise, quick-learning processes are activated. Moreover, the selection of those to participate should come from a varied product range or technological state in order avoid the direct competition within a network. When there is variety among the participants, it enables an open exchange to take place among the actors. For cooperation among the participants, it is necessary for there to be a sufficient level of trust.
- Moreover, to generate and implement new solutions to problems, *mutual competency knowledge* is necessary among the industry-relevant, non-entrepreneurial participants. Furthermore, mutuality promotes informal relations among the cooperation partners, and thereby, boosts the innovation ability to generate and implement new solutions to problems necessary for sustainable development.
- The professional exchange between environment-oriented enterprises is, also, particularly important because of the high demand for information. Environment-oriented cooperation contributes, among other things, towards the acquisition of new information relevant not only for the environmental activities within the cooperation, but in other ways as well. Expect the technical know-how exchange among the heterogeneous actors to have an overall impact on innovation; also, there will be a "piggyback" effect.

In summary, the influencing factors, comprise a strong basis of support for sustainable development. Access to a wide spectrum of information is key for all the participant levels engaged in an innovative cooperation. Information is needed, not only for the generation and

implementation of environmental innovations, but, also, for the participants' effective support of sustainable development in enterprises as well as at the regional level.

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