Improving Interaction between NGOs, Universities, and Science Shops: Experiences and Expectations

The Final Report

by
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December 2003

Supporting Science & Technology policies

A project funded by the European Commission/DG 12 under the Fifth RTD Framework Programme

Contract No. HPV1-CT-2001-60039

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II Acknowledgement

This project and this report would not have been possible without the commitment and support of others. Without crediting them for shortcomings of INTERACTS, we would like to thank *…… all who revised the report, all who wrote basic texts of former reports, all others*...proposal from kubus: Christian Hoffmann, external facilitator

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III Executive Summary

III.1 Introduction

III.1.1 The INTERACTS research project

The INTERACTS research project is a pioneer cross-national study by organisations and institutions from seven different countries – Austria, Denmark, Germany, the Netherlands, Romania, Spain, and the United Kingdom conducted in the period of January 2002 until December 2003. The INTERACTS research project is about improving interaction between NGOs, universities and Science Shops, and aims to provide information on the experiences and expectations of co-operation between small and medium NGOs and universities through intermediaries such as Science Shops.

The INTERACTS research project was funded by the European Commission, DG12 under the programme "Improving the Human Research Potential and the Socio-economic Knowledge Base" – "Strategic Analysis of Specific Political Issues". INTERACTS is an Accompanying Measure to ISSNET (the Thematic Network of International Science Shop Network, Living Knowledge).

The INTERACTS research project has included:

- A State-of-the-Art survey about political and institutional contexts of co-operation between small to medium non-governmental organisations (NGOs), Science Shops, and universities in the partner countries.
- 21 national case studies analysing experiences of interaction between NGOs, researchers, students and Science Shops and the impact on societal discourses, research agendas and university curricula
- The expectations for and perspectives of co-operation between NGOs, researchers and Science Shops expressed by stakeholder groups at the INTERACTS scenario workshops (NGOs, researchers, students, decision-makers and intermediaries)

III.1.2 The concept of Science Shops

Science Shops are organisations that offer citizens groups' free or low-cost access to scientific and technological knowledge and research in order to help them achieve

social and environmental improvement. Originally the concept of Science Shops was developed at Dutch universities during the 1970's, now Science Shops exists in a number of countries in Australia, Austria, Canada, Denmark, Germany, Malaysia, Romania, Spain, United Kingdom, and United States. Since the mid 1990'ies a international network among Science Shops have been growing, due to funding of networking and research activities by the European Community.

Most Science Shops are a department of a university, run by scientific co-ordinators, who act as the intermediary between a citizens group that proposes a question or problem and the university researchers and/or students who conduct the research. Some Science Shops are community-based and operate as non-profit private organisations through which researchers and students give advice to citizens groups.

III.1.3 Policy framework and discourses influencing the relationship between science/university and civil society

One part of the INTERACTS research project was an analysis in each country of the policy framework and discourses influencing the relationship between science and civil society. These analyses are gathered in the State-of-the-Art Report, which has served as basis for the national case studies.

The analyses in the State-of-the-Art Report showed that public discourses on science and society in most of the INTERACTS partners countries are connected to the concept of the knowledge-based society. Co-operation between science and society are perceived important, but the focus for most politicians and university policy-makers are to generate and distribute knowledge with the aim of increasing economic competitiveness, which means that scientific knowledge primarily is seen as a mean to achieve economic goals.

Business-orientation plays a dominant role in the public discourse on science and society. Resources for knowledge transfer are used to obtain economic goals rather than satisfying the needs of civil society. Due to the tendency of favoring businesses rather than civil society organisations, some Science Shops feel a pressure of having to open up for commercial clients.

No legislation related to Science Shops exists in the countries conducting the INTERACTS research project. Regulations influencing Science Shops are either pertained to universities or NGOs. This means that Science Shops depend on local conditions, regulations and goodwill, and in some cases it can put the Science Shops in a weak position when resources are distributed.

III.2 Key findings from national case studies

21 case studies were conducted as part of the INTERACTS research project, in order to analyse experiences from co-operation between NGOs and universities through intermediaries such as Science Shops. 12 of the case studies were conducted by university-based Science Shops and 9 case studies were conducted by community-based Science Shops, involving in total 16 different Science Shops in Austria, Denmark, Germany, Romania, Spain and United Kingdom. The analysed Science Shop projects concerned either environmental issues or social welfare.

The case studies show that when NGOs or citizens approach Science Shops, their need for knowledge can be categorised as 1) Scientific documentation of a problem, 2) Enhancement of knowledge around a certain topic, 3) Research of impact of governmental projects, 4) Development of solutions to a given problem, or 5) Evaluation of NGO or community services/projects. Access to free or low cost research and impartial and independent research through the Science Shops, are important to the NGO's.

The case study reports have shown that co-operation with Science Shops can have an impact on the NGOs, such as building up capacity in the NGO, and influencing the public discussion about a topic.

The case study reports also shows that Science Shops contribute to the role and tasks of the universities, by contributing to developing students competencies and skills, by applying project-orientated and problem-based methods, and by contributing to the strategic societal role of universities. It is also shown in the case study reports that Science Shop projects can have impact on curricula, lead to establishment of new research and teaching areas, and open up possibilities for scientific publications.

Through the case studies it has been identified that by mediating between civil society and science, Science Shops provides an open door and easy access to research, and they help translate the knowledge needs of NGOs into scientific questions. In some cases they carry out research, and in other cases they find students to conduct the projects. Science Shops acts as knowledge repositories ensuring continuity and progress, and they can act as an antenna for new societal topics.

III.3. Key findings from national scenario workshops

One part of the INTERACTS research project was to analyse the future expectations to co-operation and dialogue between NGOs and universities through intermediaries such as Science Shops. This was done through 7 scenario workshops held in the INTERACTS partner countries. The Scenario workshops were held as one-day events, and had participants representing four or five different role groups, e.g. Science Shops staff, university researchers and students, citizens groups and university policy makers.

The 7 scenario workshops all had the same overall aim in common, but which specific topic the scenario workshop were to discuss were up to the individual partners to decide.

The scenario workshops identified a desire among the participants for more networking and continuing discussions of how to develop the dialogue between science and society. This has resulted in a follow-up meeting in Austria organised by FBI, a conference in United Kingdom, and the establishment of a network in Denmark.

The scenario workshops further showed a wish among the participants for more open universities, which are willing and interested in problems and issues perceived important for civil society. But also more easily understandable science was an issue mentioned by the participants which they thought needs more considerations.

The scenario workshops further highlights Science Shops as well networked, established centres of knowledge transfer, interpreting for citizens and acting as bridge between academics and praxis. The scenario workshop also highlights that academics recognise their responsibility towards society and that they perceive Science Shops as one institution which can ensure knowledge sharing and research integration.

More democracy in decision-making processes was also an issue which the participants at the scenario workshops identified as important for the future dialogue between science and society. In order to obtain a higher extent of democracy in the decision-making processes, the universities needs to open up and the voices of civil society should be legitimate to address by both universities and scientists.

III.4 Policy recommendations

Based upon the findings of INTERACTS the consortium have drawn out policy recommendations for the strengthening of Science Shops. The recommendations relate to five policy issues, which have emerged through the work of the INTERACTS research project.

III.4 1. Policy issue 1: How can Science Shops support the role of NGOs in developing civil society?

NGOs are an important part of governance in society by giving voice to the citizens, and by acting to mobilise people and support those suffering from exclusion and discrimination. However, NGOs have limited access to resources because they are positioned outside statutory government funded structures. There is therefore a distance between citizens with problems and the scientists who have the expertise to help them meet these problems.

Science Shops strengthen NGO's possibilities to act responsibly and effectively through well-grounded knowledge and information. Science Shops can help bridge this distance between citizens and scientists by 1) providing access to "research capacity" for NGOs and access to the community for researchers, 2) applying user-oriented negotiation techniques which emphasise participatory dialogue and methods and 3) providing research at little or no cost conducted by researchers and/or by students.

Policy option 1:
Science Shops need to be supported as part of the development of a knowledge-based society with a democratic frame of governance.

Policy option 2:
Science Shops should ensure that the knowledge gained from partnering with NGOs on applied research projects is accessible to the wider public, through edited publication of reports in print or electronically, while respecting confidentiality of information. Science Shops' funding should be sufficiently high to allow for such publication as well as the mediation role.

Policy option 3:
Science Shops should consider the generalisability of the knowledge from a project in deciding whether a request from NGOs can be actioned. However, requests which are of a more routine nature should not be excluded, because of they can contribute to student learning and community benefit.

III.4.2. Policy issue 2: How can Science Shops influence the curricula of universities to make them more responsive to the needs and demands of wider society?

Universities are increasingly being encouraged to relate to the needs of wider society. Today the relation between universities and the wider society is mainly being developed through the exchange of knowledge between university and industry and university and government.

Problems in society are increasingly being viewed as interdisciplinary in nature, as part of the complexity of the post-modern world. However, science itself is becoming ever more specialised and scientific problems are be specified as technical, without reference to the social context within which they occur.

Science Shops give the opportunity to develop the curricula outside narrow disciplinary frameworks and encourage also awareness of knowledge and expertise within the community from which the university can also learn. Universities can therefore become a forum for reflection on knowledge and part of 'expertising democracy'.

Policy options 1:
Science Shops should be supported in their role of broadening the curricula to make them socially relevant, and thereby help delivering an important aspect of universities' mission. Community organisations as well as regional government could help this process by pressing university administrations over the necessity for such work.

Policy option 2:
Science Shops are effective when they are integrated into the activities of universities and draw in faculty staff to participate as supervisors of research projects. Barriers to student and researcher participation should be removed, so that the processes for appraising and rewarding students and researchers include explicit reference to community engagement as well as to traditional forms of research.

Policy option 3:
Science Shops should seek, where possible, to introduce and support an element of experiential learning into the existing curriculum, and they should be recognised for their expertise in this form of teaching and learning which is becoming increasingly important in the education of professionals.

III.4.3. Policy issue 3: How can Science Shops influence the research agenda to make it more responsive to the needs and demands of civil society?

Scientific knowledge plays an important role in societal development, in assessing environmental threats, the impact of new technologies such as information technology and biotechnology, as well as health and social problems, and in proposing solutions. Scientific knowledge is often seen as neutral, but is in fact contested and negotiated knowledge, while economic and organisational resources for research and development are unequally distributed at the national and international level. Businesses and governmental authorities and institutions have more resources and easier access to and influence on research facilities than NGOs such as consumer organisations, environmental organisations, trade unions, social welfare organisations etc.

Policy option 1:
Science Shops should be supported in their role of contributing to a broadening of the research agenda towards inclusion of civil society needs and demands. This requires funding for employing scientific staff and maybe also managing research grants for the funding of research based on civil society needs and demands in co-operation with NGOs.

Policy option 2:
National and international research funding should be more oriented towards financing research co-operation between research institutions and civil society organisations.

Policy option 3:
There is also an important role for the European Commission in providing opportunities for Science Shops, in collaboration with university staff, to apply for funding of research projects which have social as well as scientific value.

Policy option 4:
To encourage research in partnership with NGOs, barriers to NGO and researcher participation in civil society co-operation should be removed. NGOs require low cost access to researchers, and researchers require incentives appraising and rewarding staff to include explicit reference to community engagement and to publications written in journals directed towards the civil society. This means criteria for appointment and promotion in universities needs also to be addressed.

III.4.4. Policy issue 4: What contribution are Science Shops able to make to regional development?

European policy for a European research area places a particular emphasis on regions as drivers of economic development, and offers a role for the NGO sector, supported by Science Shops, to make their contribution to social and economic development by partnering in finding solutions to social and environmental issues.

While university-industry links have been the prime focus of regional development hitherto, it is now recognised that the NGO sector – though of varying strength in different countries – is both an important expression of civil society as well as a vital resource for social inclusion, for socially responsible employment, and for neighbourhood regeneration. However, the problem is that small or medium NGOs often lack the knowledge and resources to find scientific partners so they are unable to access resources and are excluded from scientific knowledge and policy development. Similarly, regional development agencies are often unaware of Science Shops and their potential contribution in relation to NGOs.

Policy option 1:
Regional development organisations should recognise the role of Science Shops in contributing social or environmental issues, as well as empowering NGOs through the acquisition of relevant knowledge to be effective operators in social and economic development. Science Shops should be promoted and publicised by universities as part of their portfolio of contributions to university-society linkages and regional development.

Policy option 2:
Where clients lack research skills, Science Shops should consider providing training for small to medium NGOs in research appreciation and participatory methods, in addition to carrying out research projects, as part of the process of building capacity and social capital in the voluntary and community sectors of civil society.

Policy option 3:
Regional and national associations of Science Shops should be created to support, publicise and act as pressure groups for opportunities in community-university partnerships to become more visible and more integrated into regional social and economic development. The contribution of the International Science Shops Network and of the journal Living Knowledge is an important aspect of this visibility and cooperation.

III.4.5. Policy issue 5: How can Science Shops become sustainable?

Universities are increasingly being pressed by governments to develop their mission of outreach to the surrounding community. This could provide strong pressure for the regular institutional support of Science Shop activity. The problem is that in the absence of specific funding streams for such activity, universities are unwilling to devote finite resources away from core teaching or learning and research. Additionally, there can be resistance to research which is applied in nature, rather than “pure” and the status of applied knowledge within some disciplines suffers from this discrimination, often reflected in the allocation of research grants from traditionally managed research funders.

Much Science Shop activity, which involves real costs in terms of coordination and mediation, produces benefits which are not seen or costed in monetary terms. Science Shops value therefore tends to be financially invisible. This makes it difficult to access funding when the value of the work is not economically recognised.

There are different models for funding Science Shop activities which can be considered.

Policy option 1: Full funding.
Universities providing direct financial support for Science Shops are the most readily sustainable model. The universities pay the salary of the Science Shop staff and the time of students and supervisors are given “in kind” as part of the teaching activities.

Policy option 2: Part-funding.
Where universities are unable to finance the full cost of a Science Shop, there is sometimes the possibility part-funding, by attracting external funding from government or European programmes or private and charitable grants. University management needs to be aware of the existence of Science Shops and their potential in order to include them in bidding procedures and proposals.

For Science Shops which do not receive sufficient university funding, a variety of models can be developed.

Policy option 3: Social entrepreneurship.
Some Science Shops act as social entrepreneurs supporting socially beneficial research activity with NGOs through staff conducting profitable research or business activity with organisations which can pay market costs. It is possible this model could also be developed in universities, with Science Shops being part of research centres

where profits from research conducted on a commercial basis are used to support the socially beneficial scientific research of Science Shops.

Policy option 4: Co-funding with NGOs for research and evaluation.
Another model is for Science Shops to be involved with NGOs when the latter are making application for funding by having science shop research written into the bid to provide evidence on monitoring and evaluation of services. For funders this would ensure an independent scientific assessment as part of the bid.

Policy option 5: Studentships.
A further model would provide dedicated studentships for researchers in Science Shops, who would then choose the most scientifically relevant issues to research. This model would restrict the ability to respond to requests from NGOs, but may lead in the case of PhD studentships to sustained research in one area over a period of years.

IV Table of Contents

1 General Introduction

1.1 Explanation of the concept Science Shops

Science Shops are organisations that offer citizens groups free or very low-cost access to scientific and technological knowledge and research in order to help them archive social and environmental improvement. Originally developed at Dutch universities during the 1970's, Science Shops now also exist Austria, Denmark, Germany, Romania, Spain and the United Kingdom, as well as in a number of non-European countries (including Canada and the United States of America).

In general, Science Shops provide independent, participatory research support in response to concerns experienced by civil society. They act as intermediaries between the RTD system and the public at large dedicated to better connection of scientific expertise and the public by bridging available knowledge with public concerns. The term 'science' in our sense is used broadly and includes the social and human sciences, as well as natural, physical, engineering and technical sciences.

Science Shops today are characterised by a remarkable diversity of expertise fields, organisational forms and structures and working approaches. Aiming at bridging the gap between Science and Society, e.g., by bi-directional knowledge transfer, Science Shops are taking an intermediary role, following three main organisation structures: "university based", "independent" and "mixed structures". How Science Shops are organised and operate is highly dependent on their national context. According to estimates during the last 10 years there are around seventy Science Shops in Europe now (http://www.scienceshops.org, http://www.wetenschapswinkels.nl)

1.2 INTERATCS objectives

The research consortium with eight institutions of the EU project INTERACTS, named "Improving Interaction between NGOs, Science Shops and Universities", has been carrying out a complex study on how the interactions of NGOs, Science Shops and universities can be improved. The research time span has been from January 2002 to December 2003. It was funded by the European Commission, DG12 under the programme "Improving the Human Research Potential and the Socio-economic Knowledge Base" – "Strategic Analysis of Specific Political Issues".

INTERACTS is the second study on Science Shops funded by the European Commission under the STRATA programme. The first study, named "Study and Conference on Improving Public Access to Science through Science Shops" (SCIPAS), investigated the operational options for Science Shops: Success and failure in starting Science Shops, training programmes for Science Shop staff, the development of an international Science Shop magazine, the impact of Science Shops on university curricula and research, and accomplishments and further opportunities for developing an international network of Science Shops.

In SCIPAS participated institutes from Austria, Denmark, Germany, Israel, the Netherlands, Northern Ireland, Romania, South Africa, and the USA. The results of these investigations were presented at the conference "Living Knowledge: Building partnerships for public access to research", which was held in Leuven, Belgium, from 25 - 27 January 2001 (for further information information on SCIPAS, see http://www.scienceshops.org, where all SCIPAS reports can be downloaded for free). At this conference the idea to INTERACTS was created. INTERACTS supplements and continues the work already carried out in SCIPAS.

The partners have been collaborating across disciplines and in co-operation with representative stakeholder groups to identify changes needed in structures and routines of the RTD system for improving the future interaction between NGOs, researchers, and intermediaries, like Science Shops. Bringing together the results from different countries allows a broader picture to emerge concerning past experiences with impact of Science Shops, future expectations and policy relevance as presented in this report. Thereby, INTERACTS results are contributed to strengthen the interaction between research institutions and society and bring to more in-depth understanding of processes and effects of knowledge production.

The growing need to create a culture of socially acceptable science, research and to policy makers. **This study intends to answer the following key questions:**

- How can the RTD system become more accountable?
- What are the potentials of interaction through intermediaries, such as Science Shops, to increase awareness of the mutual benefits of co-operation between universities and small to medium NGOs?
- What are the expectations for future co-operation between NGOs and universities?
- What are the functions NGOs and individual researchers expect these collaborations to perform?
- What are the changing needs and opportunities for this type of co-operation?

- Which similarities and differences regarding the above mentioned questions can be found between the participating countries Denmark, the United Kingdom, Germany, Austria, Spain, and Romania?
- In which way these findings will influence the policy recommendations on the different levels: local/ regional, national, European? development and to make them accessible to citizens creates new challenges

INTERACTS has been realised in four steps:

- Along with the State-of-the-Art Report a survey has been worked out about political and institutional conditions for the co-operation between small to medium non-governmental organisations (NGOs), Science Shops, and universities of the participating countries. This report served as a basis for the next tasks undertaken, the case studies and the participatory national workshops.
- The national case studies examine the expectations from and the practical experiences with interaction between NGOs, scientists, and Science Shops and produce an inventory of the impact, direct co-operations, mediated through Science Shops, had on NGO's, researchers and amongst Science Shops themselves.
- Future expectations and perspectives for co-operation between NGOs, scientists, and Science Shops have been discussed by four role-groups, science and researcher group, NGO and trade unions group, transfer group, policy and public authority group, in participatory workshops in each of the six study-countries. Together with the State-of-the-Art Report and the national Case Studies Reports, these discussions, reported in the national workshop reports, have produced an inventory of operational options and challenges, and changes needed for improving the future interaction between NGOs, researchers, and intermediaries, like Science Shops. Giving voice to a broader range of stakeholders democratises Science and Technology policy.
- The final report on hand, is based on national summary reports and a cross-over draft final report.
- The INTERACTS findings are and will further be disseminated at national and international workshops and conferences, aiming feedback by stakeholders.

1.3 Link to ISSNET

INTERACTS is an Accompanying Measure to the Thematic Network ISSNET (Improving Science Shop Networking). Within this Thematic Network thirteen organisations from nine countries – Austria, Denmark, France, Germany, the Netherlands, Romania, Spain, The United Kingdom, and the UAS – advance the size, outreach and impact of

the contribution of Science Shops to citizens' access to scientific information, knowledge and expertise. An indispensable step for establishing the future International Science Shop Network, ISSNET is funded by the European Commission under the programme *Raising Public Awareness of Science and Technology* of the Fifth Framework Programme (for more information, see www.scienceshops.org). The Thematic Framework Network started in 2003 and will last until 2005, as an Accompanying Measure to the ongoing International Science Shop Network (ISSNET) findings and experience of INTERACTS will be disseminated within the Living Knowledge Network on the European and global level to support the enlargement of the network of Science Shops.

1.4 Target groups of the report

The report at hand is not the only, but the final outcome of the INTERACTS consortium's work, including a State-of-the-Art report, case studies reports and workshop reports. It is intended to contribute to the growing debate in the responsibility of science and research for society at university, civil society, member state and EU level as well as further afield. The report is addressed to all those who work on funding or evaluating research and science, developing university curricula and exploiting the results of research and science.

Improving public access to research, science and technology should have a place in the structuring of the European Research Area and should be on the agenda of all those who are concerned with the development of the scientific communities and their institutions. The policy options, worked out for being presented in this report, target five groups: the EU and its institutions, the Member States and their universities, scientists and researchers, and Science Shops. Therefore the main addressed target groups of the final report at hand are:

Level	**Groups**
Local	Policy makers: Universities, Government, Administration;
Regional	Policy makers: Government, Administration, NGO, Bodies
National	Policy makers: Government, Administration, NGO, Bodies
European	Policy makers: Administration

1.5 EC policy: STRATA

INTERACTS was funded by the European Commission, DG12 under the programme "Improving the Human Research Potential and the Socio-economic Knowledge Base" – "Strategic Analysis of Specific Political Issues" (STRATA) within the Fifth Framework Programme.

STRATA (Strategic Analysis of Specific Political Issues) programme aims to bring researchers, policy-makers and other societal stakeholders together for a continuous dialogue on general science, technology and innovation policy (STI) issues of European relevance. Through measures, such as establishment of networks and expert groups, policy-makers and other stakeholders become more involved with new state-of-the-art knowledge and the relevance of research is increased, thus the efficiency and effectiveness of communication among them is increased. The Strata programme is building upon the experience of science and technology policy research in previous Framework Programmes (e.g. FAST, MONITOR, AND TSER).

STRATA provided a support for analytical and synthesis work on specific science and technology policy issues in four main thematic areas: Policy development for the research, technology development and innovation (RTDI) system; policies to leverage investment in resources for RTDI; science and governance: impact on other policies; and improved policy co-ordination in the European science systems (http://www.cordis.lu/improving/strata/strata.htm).

By identifying needs and opportunities for policy in collaborations of small to medium NGOs with universities and Science Shops, INTERACTS contributes to strengthening linkages between research institutions and society at large and, thereby, will allow good practice to emerge. This is, among others, in accordance with priority (i) ("Policy development for the RTDI system") of STRATA. By investigating the collaborations of small to medium NGOs with universities and Science Shops, the findings of INTERACTS lead to better understanding of the sources and functioning of expertise. This is in accordance with STRATA priority (iii) ("Science and governance: impact on other policies").

The European Commission acknowledge the important role of Science Shops as a medium for improving public access to, and public awareness of, science and technology by dedicating Action 21 of its current Action Plan "Science and Society" to Science Shops and is currently examining a variety of new ways of strengthening and

promoting the role of Science Shops under the Sixth Framework Programme for research.

1.6 Objectives of the report

The main objective of the final report at hand is to disseminate improved potentials as well as barriers of the R&D-system to enable effective and sustainable future co-operation between NGOs, researchers and intermediaries, such as Science Shops. Additionally the report presents policy recommendations to support future strategies and conditions for those co-operations, addressing all levels for change: local/ regional, national, European.

To bring together the political agenda issues with the empirical national results of the INTERACTS study and cross-analyses results, a common criteria scheme was necessary, as well as an overview on political agenda programmes and key issues (done by Science Shops “kubus” and “Vienna”). The meeting minute and the mentioned overview have been helpful to reach project findings on policy options.

The developed recommendations for policy strategies to initiate change are based on the following main topics, analysed during the INTERACTS studies:

- The possibilities for democratising Science and Technology policy decision-making
- The access of NGOs and citizens to participate in Science and Technology decisions
- The conditions for intermediaries like Science Shops
- The conditions for university teachers and researchers to work with NGO-initiated and NGO-related topics as part of their research and teaching activities.

1.7 Structure of the final report

This aim is reflected by the report structure, focused on the development of policy options. The **executive summary** presented by Søsser Brodersen and Michael Søgaard Jørgensen (DK), highlights the main INTERACTS finding. The **Introduction**, is presented by Dr. Wolfgang Endler, Kirsten von der Heiden (D), Michael Strähle (A) and Søsser Brodersen (DK). The next contribution deals more detailed with **policy options**, presented by Irene and David Hall (GB) and Michael Søgaard Jørgensen (DK). The **methodology** is topic of the following chapter, written by Irene and David Hall (GB), Kirsten von der Heiden (D), Søsser Brodersen and Michael Søgaard Jørgensen (DK), Gabriela Schroffenegger and Andrea Gnaiger (A).

The **policy recommendations** is presented by Irene and David Hall (GB) and Michael Søgaard Jørgensen (DK), though based on information and comments from all partners, including the subcontractor Loet Leydesdorff (NL).

The **cross analyses of the national case studies,** leading to policy options, presented by Michael Søgaard Jørgensen, and Søsser Brodersen (DK) and Andrea Gnaiger (A) are based on the national case studies reports, the national summary reports of each consortium member organisation and the Internet based investigation carried out by the subcontractor Loet Leydesdorff. Dr. Gabriela Schroffenegger (A) have carried out the **cross analyses of the participatory EASW workshops**, leading to policy options. The EASW cross analyses are based on the national case studies reports and the national summary reports of each consortium member organisation.

The national section is the last part of the final report, consisting of **summaries of the national findings**. This includes the results of the State-of–the-Art Report, the Case Studies Report, the EASW Workshop Report, the National Summary Reports, and additional publications and analyses of the respective countries and consortium partners.

All partners have commented and given input to the chapters in the final report.

1.7.1 Summary of the chapters

DTU will provide this chapter

2 Policy recommendations for the strengthening of Science Shops

2.1 Introduction

One of the objectives of INTERACTS has been to *"draw out policy implications for future cooperation in science, technology and innovation, in particular the cooperation of small to medium NGOs with universities through intermediaries such as Science Shops"* (INTERACTS proposal 22 Sep 2001). This chapter presents the policy recommendations, which has been developed on the basis of the experience from the INTERACTS project.

The policy recommendations are based on

- The State-of-the-Art survey about political and institutional contexts of co-operation between small to medium non-governmental organisations (NGOs), Science Shops, and universities in the partner countries.
- The 21 national case studies analysing experiences of interaction between NGOs, researchers, students and Science Shops and the impact on societal discourses, research agendas and university curricula
- The expectations for and perspectives of co-operation between NGOs, researchers and Science Shops expressed by stakeholder groups at the INTERACTS scenario workshops (NGOs, researchers, students, decision-makers and intermediaries)

The following paragraphs present five policy issues of relevance for the future role of Science Shops and suggest policy options in relation to each of the themes. Each theme is discussed under the headlines:

- The policy issue
- The Problem: Background
- Evidence from INTERACTS
- Policy Options

The five policy issues are:

1. How can Science Shops support the role of NGOs in developing civil society?
2. How can Science Shops influence the curricula of universities to make them more responsive to the needs and demands of wider society?

3. How can Science Shops influence the research agenda to make it more responsive to the needs and demands of civil society?
4. What contribution are Science Shops able to make to regional development?
5. How can Science Shops become sustainable?

2.2 Question 1

How can Science Shops support the role of NGOs in developing civil society?

The Problem: Background

NGOs are an important part of governance in society by giving voice to citizen concerns and acting as early warning systems for emergent problems in society. They act to mobilise people and support those suffering from exclusion/ discrimination. However, NGOs and in particular small and medium sized NGOs have not always access to all the expertise they find necessary in their activities, because of their restricted resources and because by their nature, they are positioned outside statutory government funded structures. There is therefore a distance between citizens with problems (most of them raised through NGOs) and the scientists who have the expertise to help them meet these problems. This distance is structural, cultural and economic.

While NGOs are usually adept at networking with similarly placed organisations, to increase bridging social capital (Putnam, 2000) they need to be able to network with organisations which have resources which can benefit them and their members and clients. Organisations with scientific expertise can be essential to the effective functioning of NGOs – to help them articulate demand, and meet their goals effectively. Knowledge therefore becomes innovatory where NGOs use such knowledge to redefine their activities.

Evidence from INTERACTS

Science Shops as intermediaries can bridge the gap between science and NGOs. INTERACTS data shows Science Shops can help bridge:

- The structural divide - through providing access to “research capacity” for NGOs and access to the community for researchers
- The cultural divide – through user-oriented negotiation techniques which emphasise participatory dialogue and methods
- The economic divide – through research at little or no cost conducted by researchers and/or by students

Science shops are considered as general service agencies for citizens and NGO's expect them to meet their actual needs. Among other things, these needs includes intermediation between actors, bringing together practical and theoretical knowledge from different domains and social groups plus networking activities with and for NGOs on a national and international level.

INTERACTS findings showed how NGOs approached Science Shops over social or environmental problems or needs, or because of their desire to develop their services and perform more effectively. NGOs seem to have one or more of the following wishes to Science Shop research:

- Produce scientific documentation to authorities about the need for action
- Enhance knowledge around a topic as part of their activity
- Facilitate or improve networking with other organisations
- Access knowledge from governmental institutions or organisations
- Develop solutions to problems as part of an innovation process
- Evaluate their service provision and community projects
- Develop new knowledge-intensive services based on new insights

From the viewpoint of NGOs, Science Shops provide impartial, independent research, which may be provided by community-based or university-based Science Shops that have the benefit of being close to the citizens. Because Science Shops are co-operating with universities, they have the benefit of scientific credibility from their institutional base and are able to mobilise their resources (e.g. labs and libraries) for community benefit via student projects or researcher projects (bridging social capital). Both types of Science Shops provide access to high quality scientific, methodologically sound research and are less bureaucratic than statutory institutions. The issue is to include organisations and groups currently excluded from civil society and its economic benefits through developing knowledge intensive and advanced capacity.

The growth of the knowledge economy and society leaves universities to become more closely involved in community life. The university can increasingly become forum of reflection on knowledge, as well as of debate and dialogue between scientists and people (the role of the universities in the Europe of knowledge, communication, Brussels 2003). INTERACTS experience show Science Shops can contribute developing universities' role as for a for dialogue between scientists and people.

The bibliographic and scientometric research about the dissemination of the Science Shop publications showed that in some cases the research provided by Science Shops to NGOs was not readily accessible by wider society. In some cases the publications

remain as “grey literature” with confidential information concerning the sponsoring NGO and in some cases are the limited resources of the Science Shops are a barrier to wider dissemination.

The case studies and workshop participants confirmed a need for increased public relations activities of Science Shops, albeit not all science shops have enough resources to do this.

There is in some cases a tension in developing a dialogue which opens up higher education institutions to the needs of civil society, between Science Shops on the one hand being willing to respond to all requests from NGOs for specific information and knowledge, and on the other hand their concern to prioritise for research those requests which are likely to lead to new generalisable knowledge. The latter type of project proposals seem in some cases to be more attractive to students and researchers in their scientific work, because the give the best possibilities for publishing scientific articles based on the Science Shop project afterwards.

Policy Options

Science Shops are essential at the local level in bridging the distance between science and the public through their intermediary role. They strengthen citizen groups’ possibilities to act responsibly and effectively through well-grounded knowledge and information. This role needs to be supported as part of the development of a knowledge-based society within a democratic frame of governance.

Science Shops should be more widely known. To attain this goal, they should increase their public relation activities. Organisations without the required personnel and financial resources for it, should be supported by providing additional resources to become more widely known.

Science Shops should also take steps to ensure that the knowledge gained from partnering with NGOs on applied research projects is accessible to the wider public, through edited publication of reports in print or electronically, while respecting confidentiality of information. Science Shops’ funding should be sufficiently high to allow for such publication as well as the mediation role.

Science Shops should consider the generalisability of the knowledge from a project in deciding whether a request from NGOs can be actioned. However,

requests which are of a more routine nature should not be excluded, because they can contribute to student learning and community benefit.

Because Science Shops have to react to the changing needs of NGOs and citizens, their activities to enlarge their range of services and regular evaluation of the needs of their client base should be funded.

2.3 Question 2

How can Science Shops influence the curricula of universities to make them more responsive to the needs and demands of wider society?

The Problem: Background

Universities are increasingly being encouraged to relate to the needs of wider society - what for example is known as the Third Mission in the UK (i.e. to the first two missions of teaching and research is added community engagement). Concern about graduate employability has also impacted on the curriculum through the move to develop work-related skills in student education.

The relation between universities and the wider society is to day mainly being developed through the exchange of knowledge between university and industry and university and government. The advantage of Science Shops is that they have a more broad-based aim to work with civil society in developing debate and dialogue between scientists and citizens, which requires the capacity to apply theoretical knowledge and problem-solving learning methodology to real-life situations. This orientation develops social awareness, citizenship values and problem-solving skills in a meaningful arena as well as equipping students with the essential skills for future work. NGOs gain access to highly qualified university personnel while universities benefit from access to a wide variety of social groups and public issues.

Problems in society are increasingly being viewed as interdisciplinary in nature, as part of the complexity of the postmodern world. However, science itself is becoming ever more specialised and scientific problems are specified as technical, without reference to the social context within which they occur. Increasingly, sophisticated ethical issues are arising as a result of this misfit of scientific training and citizen demands for a healthy and secure environment.

Evidence from INTERACTS

Science Shops at universities may be department based (though with a university-wide role) or based in Schools or Faculties (depending on university structures and resourcing). Science Shops allow for the opportunity to develop the curricula outside narrow disciplinary frameworks and also encourage awareness of knowledge and expertise within the community from which the university can also learn. Universities can therefore become a forum for reflection on knowledge and part of 'expertising democracy'. This role goes hand in hand with 'democratising expertise' as university based knowledge is made applicable to the wider society (White Paper on Governance, Brussels 2001).

The INTERACTS case studies show that through Science Shop activity (both by university-based and community-based Science Shops) students enhance or develop some of these skills and competencies:

- Social competencies
- Employable skills
- Real life experiences
- Communication and co-operation
- New knowledge and perspectives
- Knowledge and expertise
- Connection with and recognition of needs and demands of civil society groups
- Computer skills

Curricular enlargement is also evidenced in research publications which provide additional reward and recognition for students and researchers as well as providing benefit to community groups. Applied research reports aimed at groups need to be written in clear, accessible language rather than in scientific terminology, and this requirement in itself represents a considerable enlargement to standard academic teaching and learning.

The development of Science Shops in Romania has contributed to the general broadening of the role of universities by contributing to co-operation projects, new educational programs and facilitation of co-operation with different societal groups.

Policy Options

Science Shops (both university- and community-based) should be supported in their role of broadening the curriculum to make it socially relevant, and thus helping to deliver an important aspect of universities' mission. Community organisations as well as regional government could help this process by pressing university administrations over the necessity for such work.

Science Shops in universities are effective when they are integrated into the activities of universities and draw in faculty staff to participate as supervisors of research projects. To encourage this to happen, barriers to student and researcher participation should be removed, so that the processes for appraising and rewarding students and researchers include explicit reference to community engagement as well as to traditional forms of research.

Science Shops should seek, where possible, to introduce and support an element of experiential learning into the existing curriculum, and they should be recognised for their expertise in this form of teaching and learning which is becoming increasingly important in the education of professionals (Schõn, 1987).

The reward schemes of the scientific community and the commonly applied quantitative evaluation approach should not be the only measures of choice for assessing the quality of Science Shop activities. New forms of quality evaluation in science and research need to be developed to ensure best practice for participatory and/or civil society-oriented science and research, which guarantee inter-subjectivity and transparency.

2.4 Question 3

How can Science Shops influence the research agenda to make it more responsive to the needs and demands of civil society?

The Problem: Background

Scientific knowledge plays an important role in societal development, in assessing environmental threats, the impact of new technologies such as information technology and biotechnology, as well as health and social problems, and in proposing solutions. Scientific knowledge is often seen as neutral, but is in fact contested and negotiated knowledge, while economic and organisational resources for research and development are unequally distributed at the national and international level. Businesses and governmental authorities and institutions have more resources and easier access to and influence on research facilities than NGOs such as consumer organisations, environmental organisations, trade unions, social welfare organisations etc.

The problem is how best to support the new relationships which have been developing between science and civil society that permit NGOs and citizens to become critically engaged in the regulation and agenda setting of science and technology, e.g. to influence science and technology policy. During the last two decades different initiatives and structures have emerged in Europe. Science Shops, large NGOs with research capacities, independent institutes, patients' organisations, and community groups have become engaged with research and developed countervailing expertise. They have proven their capacity to propose and to develop research topics and fields, often leading to transdisciplinary projects, and to directly link research to social needs. However small to medium NGOs, representing citizens at the local community level, have been more excluded from contributing their expertise and from framing researchable questions through lack of resources and research capacity.

Evidence from INTERACTS

In the investigated countries, Science Shops and research dedicated to civil society organisations at large are not on the agenda of RTD policy. They are mentioned here and there, but are most often not seen as an important topic of the political debate. The financial and the symbolic support the European Commission lends to Science Shops are unique and increase their reputation.

Science Shops represent a strategy for giving NGOs access to research capacity and thereby potentially influencing the research agenda in society in general and at the universities. This is a two-way process, as Science Shop projects can also develop the perception of the NGOs of what is researchable and of the potentials and limits of research.

Most Science Shop projects at the university-based Science Shops are carried out by students under the supervision of academic staff, but the individual focus of small-scale research means that the long-term impact on the research agenda from the single science shop project is often limited. However, by accumulating projects across different NGOs and over time, Science Shops can act as a knowledge repository, where knowledge about a certain topic is gradually built from project to project.

In addition, Science Shops are in the forefront of reformulating the division between basic and applied research, with emphasis on the production of pure knowledge being matched by an emphasis on knowledge implementation, development and diffusion. The reformulation creates a knowledge "avenue" which lowers the threshold between the universities and their surrounding environments, helps local groups to articulate

their needs and demands, while the Science Shop itself provides the intermediation essential for brokering such innovation.

But, it can be difficult to find supervisors for Science Shop projects, if the scientific staff do not find the topic proposed by the NGO scientifically interesting. Mediation through the Science Shop between the NGO and the researchers may help translating proposed topics into scientifically interesting questions. However, and additional issue, is that most Science Shop projects lead to reports, which can be characterised as "grey literature", and not to research-rated scientific publications such as articles in peer-reviewed scientific journals. This limits in some cases the interest of researchers to engage in Science Shop projects.

Science Shops have in some cases demonstrated their value in acting as an antenna for new concerns of civil society and a repository for new scientific research themes. The Science Shop can either act as an incubator for a new research theme until a critical mass of interest develops among existing research groups, or act as facilitator of research between civil society and a research department and maybe also governmental authorities, at a national or regional level, which may be interested in funding research.

The gratification system of the scientific communities heavily relies on publications. Some workshop participants pointed out that the still prevailing quantitative evaluation by measuring publication and citation rates alone negatively effects Science Shops. Science Shops activities are not restricted to research alone; they involve considerable intermediation tasks, which tend to remain invisible and, because of the prevailing gratification system, which considers them as neglectable, unrewarded

Policy Options

To be on the agenda of RTD policy, Science shops should be more widely known to policy makers. Action 21 of the Science Society Action Plan about Science Shops has already helped to increase policy makers' interest in and the reputation of Science at all levels, because policy makers take into account the guidelines from the European Commission. To grow the attention to and the reputation of Science Shops in a follow-up to the Action Plan, the importance of research dedicated to civil society concerns and the role science shops play here could be stressed in a Communication from the European Commission.

Science Shops should be supported in their role of contributing to a broadening of the research agenda towards inclusion of civil society needs and demands.

This requires funding for employing scientific staff and maybe also managing research grants for the funding of research based on civil society needs and demands in co-operation with NGOs. An example is the model developed at the Tilburg University in the Netherlands, where the Science Shop can co-finance PhD research together with research departments. Community organisations as well as regional government could help this process by pressing university administrations over the necessity of such work.

Another example is the Collaborative Awards in Science and Engineering (CASE) of the Economic and Social Research Council in the UK. PhD studentships are awarded on the basis of joint applications from a university department and an external organisation for jointly supervised research on a topic of concern to the external organisation. It should be noted however that the financial contribution element required from the participating external organisation rules out participation from many small to medium NGOs.

National and international research funding should be more oriented towards financing research co-operation between research institutions and civil society organisations. This could include funding of research programmes like the community-university research alliances (CURAs) developed by Canadian research councils. An important feature of the CURA funding is the extensive preparatory grant for the creation and development of community-university partnerships, which has been increased over time as a proportion of the funding in response to feedback on the operation of the CURAs.
There is also an important role for the European Commission in providing opportunities for Science Shops, in collaboration with university staff, to apply for funding of research projects which have social as well as scientific value. This could include (partial) funding of PhD projects, or even Master bursaries, to encourage and support research into a variety of topics, from environmental issues to asylum seekers and homelessness.

To encourage research in partnership with NGOs to happen, barriers to NGO and researcher participation in civil society co-operation should be removed. NGOs require low cost access to researchers, and researchers require incentives appraising and rewarding staff to include explicit reference to community engagement and to publications written in journals directed towards the civil society. This means criteria for appointment and promotion in

universities needs also to be addressed.

2.5 Question 4

What contribution are Science Shops able to make to regional development?

The Problem: Background

The SCIPAS reports showed that Science Shops in the Netherlands, where they first originated, besides making a contribution to the understanding and solution of local issues, also have a role in sharing and applying that knowledge at a regional and national level. The existence of a coordinating network of Science Shops in the Netherlands is important for sharing knowledge, for supporting individual science shop mediation, and for raising the visibility of Science Shops in regional and national policy.

European policy for a European research area places a particular emphasis on regions as drivers of economic development, and offers a role for the NGO sector, supported by knowledge producers in Science Shops, to make their contribution to social and economic development by partnering in finding solutions to social issues.

Because the local and regional levels are closer to citizens' experiences than national or European government, questions about science and society are better discussed in local and regional contexts, where complex issues are grounded in actual social problems, and specific interventions – whether in the environment or in health and social welfare – can be discussed, researched, and learned from.

An example is the UK Government, whom in its September 2002 'Cross cutting review of the role of the voluntary sector in public service delivery' recognised the need to create a framework in which the voluntary and community sector can flourish, and be strong and independent. In particular, it is concerned about how Central and Local Government could work more effectively with the voluntary and community sector (VCS) to deliver high quality services.
(http://www.hmtreaury.gov.uk/spending_review/spend_ccr/spend_ccr_voluntary/spend_ccr_voluntary.cfm)

While university-industry links have been the prime focus of regional development hitherto, it is now recognised that the NGO sector – though of varying strength in different countries – is both an important expression of civil society as well as a vital

resource for social inclusion, for socially responsible employment, and for neighbourhood regeneration (White Paper in Governance, Brussels 2001). However, the problem is that small or medium NGOs often lack the knowledge and resources to find scientific partners so they are unable to access resources and are excluded from scientific knowledge and policy development. Similarly, regional development agencies are often unaware of Science Shops and their potential contribution in relation to NGOs.

Evidence from INTERACTS

The INTERACTS case studies provide examples of relatively small-scale projects, which have had impact on the NGOs and in many cases on their service users and members. Additionally, the findings from Science Shop research have been used as independent evidence to justify and draw down funding for the NGOs to operate in the field of health and social welfare, providing benefits to service users who would otherwise be outside the scope of statutory services and unable to afford private care. Similarly, case studies in environmental projects show the strength of community-university partnership in enabling advances to be made in environmentally-friendly practice at the local level.

Through contacts and projects with numerous different NGOs working in specialised fields of health and social welfare, Science Shops are able to build up a bigger picture of the variety of provision – and often, lack of provision – at a local level, while also gaining knowledge of the changing relationship of the voluntary and community sector to other service purchasers and providers, statutory and private. They also become aware of the capacities of the NGOs in utilising participatory methods, and the extent to which training in research design and appreciation, as well as the interpretation and application of findings, can be improved.

The strongest evidence of demand for regional input within the INTERACTS project came from the scenario workshops, where both NGO representatives, university representatives and policy makers have argued that Science Shops should respond to community needs, but that also they should help drive good practice in universities through using education and research to develop citizenship for the solution of social and environmental problems.

Policy Options

Regional development organisations should recognise the role of Science Shops in contributing in their own right to knowledge about social and environmental issues, as well as empowering NGOs through the acquisition of

relevant knowledge to be effective operators in social and economic development.

The visibility of Science Shops is important, as small or medium NGOs might lack the knowledge and resources to find scientific partners. Science Shops at universities should be promoted and publicised by universities as part of their portfolio of contributions to university-society linkages and regional development in order to make them visible outside the university.

Where clients lack research skills, Science Shops should consider providing training for small to medium NGOs in research appreciation and participatory methods, in addition to carrying out research projects, as part of the process of building capacity and social capital in the voluntary and community sectors of civil society.

Regional and national associations of Science Shops should be created to support, publicise and act as pressure groups for opportunities in community-university partnerships to become more visible and more integrated into regional social and economic development. The contribution of the International Science Shops Network and of the journal Living Knowledge is an important aspect of this visibility and cooperation.

2.6 Question 5
How can Science Shops become sustainable?

The Problem: Background

A report from the SCIPAS project, about Science Shop concepts (Gnaiger and Martin, 2001) demonstrated that Science Shops in the Netherlands in most cases have considerable institutional support, with Science Shops being attached either to university departments (specialist) or universities (generalist). In each case, they have access to a small but significant and regular amount of funding for core staff as scientific mediators. The Netherlands model has been followed by some other countries with scientists or mediators working in a university context. However, specific funding for Science Shop personnel is not always available. An alternative model for Science Shops has also developed, with Science Shops performing a

research/mediation function and drawing on university-trained researchers, but as autonomous social enterprises independent of universities.

Universities are increasingly being pressed by governments to develop their mission of outreach to the surrounding community. This could provide strong pressure for the regular institutional support of science shop activity. The problem is that in the absence of specific funding streams for such activity, universities are unwilling to devote finite resources away from core teaching or learning and research. Additionally, there can be resistance to research which is applied in nature, rather than “pure” and the status of applied knowledge within some disciplines suffers from this discrimination, often reflected in the allocation of research grants from traditionally managed research funders.

For the voluntary and community sector, performance measurement and accountability have become increasingly important in justifying support from public and private funds. Yet many contributions are in the form of voluntary action, which is unaccounted for in traditional financial reports. Assessing the total impact of volunteering should take account of different stakeholders: the volunteer, the volunteer-involving organisation, the recipients/beneficiaries, the local community and the wider society; and different types of ‘capital’: economic, physical, social, human and cultural. A total volunteer audit can be a complex task requiring a multi-method approach.

The problem is that much Science Shop activity, which involves real costs in terms of coordination and mediation, produces benefits which are not seen or costed in monetary terms. Their value therefore tends to be financially invisible. This makes it difficult to access funding when the value of the work is not economically recognised.

One approach to solving this problem has been the recently developed guide in the UK to placing a financial value on voluntary action - VIVA - the Volunteer Investment and Value Audit (Institute of Volunteering Research, 2003). VIVA is a measurement tool that assesses the ‘outputs’ of volunteer programmes (the value of volunteers’ time) in relation to the ‘inputs’ (the resources used to support the volunteers). It therefore provides informative and readily grasped indicators of the scale and significance of voluntary work and the payback on an organisation’s investment in voluntary action. This can also be employed to audit the net benefits of science shop research projects, where the student researchers make a contribution to the voluntary and community sector at no or low cost (typically expenses only).

Evidence from INTERACTS

NGOs which are small or medium sized are unable to pay a commercial rate for research. As these are the Science Shop partners and clients, the philosophy of Science Shops is to emphasize the enabling of research at nil, low or affordable cost. This social benefit is recognised by the organisations as an exchange of knowledge, skills and resources between universities and NGOs.

The input from universities, in the form of students' and supervisor's time, can be given an imputed value, in the case of the UK case studies, of over £2,000 per project (~3,000 euros). There is only a small marginal cost to universities, however, as students require teaching and supervision in any case. This represents a benefit to voluntary and community sector organisations, from which however they would need to deduct the extra cost of their staff time in administering their part of the student project in terms of training and supervision to arrive at net benefit. This is in line with an evaluation study on Austrian Science Shops that showed that Science Shops were very cost-efficient and attained all goals (Pflichter et al, 1994)

The case studies showed that Science Shop research reports in several cases have been successfully used by NGOs as evidence for funding applications, and this financial value could also be imputed to research projects. Similarly, Science Shop projects have been found to stimulate academic funded research in a particular area. In terms of sustainability, it is important that the costing of science shop value and benefit be done in financial and economic terms as well as in terms of social and educational benefit.

Where voluntary and community sector organisations are obliged by the conditions of their funding to evaluate their actions, the science shop model provides an efficient method of doing this, with additional benefits through the training both of students and voluntary and community sector participants in the use of applied research. Again there needs to be recognition within the funding of NGOs that evaluation is an important activity which Science Shops can provide. This would be more sustainable if Science Shops could be written into NGO grants as external consultants for evaluation under joint-funding arrangements.

Policy Options

There are different models for funding Science Shop activities which can be considered:

- **Full funding.**
  The Netherlands model of universities providing direct financial support for Science Shops is the most readily sustainable model. The university pays the salary of the Science Shop staff and the time of the students and researchers are free in the sense that the students anyway should carry out projects and researchers anyway supervise the students. Any cost-benefit model should include the whole range of benefits provided to the institutions, scientists/researchers, students and NGOs and civil society. Science Shops should collaborate with voluntary and community organisations in developing appropriate models for auditing the financial benefits of partnership in research. The VIVA model provides a good starting point.

- **Part-funding.**
  Where universities are unable to finance the full cost of a Science Shop, there is sometimes the possibility part-funding, by attracting external funding from government or European programmes or private and charitable grants. However, such funding arrangements are inherently less stable, and require Science Shop staff to devote much of their time to fund-raising. In this context, university management needs to be aware of the existence of Science Shops and their potential in order to include them in bidding procedures and proposals. This means Science Shops need to work at the strategic level within universities, with representation in the committee structure, to raise awareness of what they are and what they have to offer.

For Science Shops which do not receive sufficient university funding, a variety of models can be developed:

- **Social entrepreneurship.**
  Some Science Shops act as social entrepreneurs supporting socially beneficial research activity with NGOs through staff conducting profitable research or business activity with organisations which can pay market costs. It is possible this model could also be developed in universities, with Science Shops being part of research centres where again profits from research conducted on a commercial basis could be used to support the socially beneficial scientific research of Science Shops.

- **Co-funding with NGOs for research and evaluation.**
  Another model is for Science Shops to be involved with NGOs when the latter are making application for funding by having science shop research written into the bid to provided evidence on monitoring and evaluation of services. For funders this would ensure an independent scientific assessment as part of the bid. This model is most likely to develop when there is a long-term relationship between a science shop and a specific NGO.

- **Studentships.**
  A further model would provide dedicated studentships for researchers in Science Shops, who would then choose the most scientifically relevant issues to research. This model would restrict the ability to respond to requests from NGOs, but may lead in the case of PhD studentships to sustained research in one area over a period of years.

3 Methodology of INTERACTS

3.1 Introduction

The discussion in this chapter reflects the emphasis in the INTERACTS contract for Work Package 2 (WP2) 'Setting up a common methodology' (Appendix 1) which stressed that the WP2 deliverable was 'a case study methodology for analysing co-operation between NGOs and the research system and the impact on societal and scientific discourses and on research and curricula'. WP2 also included developing a common strategy for 'national workshops with group discussions' and for this reason reference is made below to the scenario workshop methodology.

The INTERACTS project is about improving interaction between NGOs, universities and science shops, and aims to provide information on the experiences and expectations of cooperation between small and medium NGOs and universities through intermediaries such as science shops (INTERACTS website: http://members.chello.at/wilawien/interacts/main.html). The project concentrates in the first 12 months on the experiences of cooperation, and in the final 12 months on the expectations for future cooperation and development.

The INTERACTS methodology has been the basis for the production of three interlinked Work Packages and the reports on their outcomes: the *State of the Art Report* (WP3), *The Case Studies Report* (WP4), and the *Scenario Workshops Report* (WP5). These reports have in turn fed into the Final Report (WP6).

All partners on the Project have contributed to the discussions on methodology, through email communication and especially through the sequence of project meetings. The State of the Art methodology was the responsibility of the Berlin partners who took the lead in providing guidelines for the collection and analysis of the information. The UK partners had responsibility for the Case Study methodology with specific input from the Dutch sub-contractor and the Danish team, while partners from Seville and Innsbruck provided the expertise for the Scenario Workshops in terms of training and support materials. All partners responded to the papers and draft reports which circulated on methodology throughout the project and contributed to producing the analytical frameworks and the reports of findings.

A first task for the INTERACTS research project was for each national partner to contribute to a *State of the Art* report, to set out the baseline with regard to science

shops and science policy. The State of the Art Report described the methods as follows:

> For the overview of the public discourse on science and society, current literature is reviewed. For the policy analysis, literature and web sites have been studied and the programmes of political parties were analysed. Political parties were questioned via e-mail, followed by telephone interviews with representatives in some cases. In addition, interviews were conducted with Science Shop and NGO representatives and with policymakers. Each of the partners collected data with a common analysis framework and the authors evaluated the information and put it together (Fischer, Wallentin et al, 2002: 8-9).

Details of the common analysis framework can be found in Appendix 1. This commonly agreed framework is an example of the continuing concern of the project – to employ methodologies which would enable national diversity to be explored and accounted for, while using shared categories to allow comparison across the different countries.

The State of the Art exercise sensitised the project partners to the policy environment of European science shops and flagged up right from the start, that INTERACTS was not simply a research project, but a project designed to generate policy and advocate action at the European level.

The State of the Art Report raised issues for the major research activity of the project, the *Case Study* research (considered in detail below), providing avenues for questioning and for analysis. The case studies in turn helped provide the agenda for the *Scenario Workshops.* The INTERACTS Scenario Workshop used methodology adapted from the European Awareness Scenario Workshop (EASW) (www.basisinnovation.com/easwtobasis.htm). This methodology was originally developed by the European Commission's Innovation Programme in 1994 as a way of promoting awareness and planning for sustainability in the urban environment. The method was designed to bring together participants from different backgrounds – technology experts, policy makers, residents, and employers – to consider future scenarios and to plan how they could overcome barriers to success.

INTERACTS partners decided that the 'national workshops with group discussions' (specified in the contract) would best be delivered through scenario workshops, using the expertise of partners in the Project (in Innsbruck and Seville). The INTERACTS scenario workshops conducted in the Spring of 2003 brought together researchers,

scientists, NGO practitioners, decision / policy makers and science shop staff in locations based on the 7 partners in order to look at how the relationship between science and society (university and community) could be strengthened through science shop activity. The workshops were participatory in nature to encourage a free development of ideas concerning policy issues for the future – for a 'scenario' of 10 years time.

The workshops provided the opportunity to disseminate INTERACTS and science shop information, and, more importantly, to translate the findings of the case study research into policy options for local and national groups to consider and develop. These produced outcomes which refined the issues introduced in the state of the art report, by developing them at a local level. The Final Report is intended to bring together the key national findings from all these activities into a comparative analysis for dissemination to NGOs, researchers, science shops and policy makers at national and European levels. The main objective of this Report is to relate the findings from the project to policy objectives and recommendations, drawing upon current concerns in the science/ society discourse and using the empirical data to direct the European Commission to areas where science shops can make a vital input. All the methodology on the project was developed with these aims in mind.

3.2 State-of-the-Art Methodological approach

The State-of-the-Art report (Fischer & Wallentin, 2002) presents an overview of political and institutional conditions for the co-operation between small and medium NGOs (as the predominant target group of Science Shops), Science Shops, and universities in Austria, Denmark, Germany, Romania, Spain and United Kingdom.

This analysis was carried out in two steps:

- First, by depicting the general scientific and public discourse on interrelation between science and society by a literature analysis
- Secondly, by carrying out policy analysis of different programmes and legislation referring to the interrelation between science and society.

Public discourse on science and society was analysed for references to such co-operation to find out if and to what extent interaction between research institutions and small and medium NGOs is already present and supported. Based on their hands-on experiences, Science Shop staff members have named options and challenges for co-operating with their clients.

Governmental policy papers, programmes of political parties, university mission statements, national legislation, interviews with politicians, Science Shop and university staff members, and literature on Science Shops and NGOs provide the basis for this analysis.

The central key-questions followed are:

- To what extent is the idea of interaction between science and society represented in the public and political discourse? In particular, to what extent is the concept of Science Shops as intermediary institutions known and named?
- Which potentials and barriers arise from theses findings for co-operation between NGOs, science institutions and intermediaries such as Science Shops?
- In the context of hindering and supporting factors, where are the starting-points for fostering co-operation between NGOs and science? For example, regarding political and public lobbying? Regarding Science Shop practice?

The adapted country methodology is described in the countries sub-chapters of the State-of-the-Art report.

3.3 The Case Study Approach

Case study research was chosen for the second research exercise on this INTERACTS Project, on the experiences of science shop mediation. This approach could provide detailed data on the varied experiences of the very different science shops in the member countries. Case studies are not merely descriptive, they are based on analytic categorisation and are designed to inform policy. According to key writers in this field:

> The research goal in a case history is to get the fullest possible story for its own sake. In contrast, the case study is based on analytic abstractions and constructions for purposes of description, or verification and/ or generation of theory. There is no attempt at obtaining the fullest possible story for its own sake.
> (Strauss and Glaser, 1977: 183)

Case studies have a long history of use in social science research, and it is recognised that can generate uniquely important views of social processes, which may have both exploratory and explanatory emphases (Platt, 1992; Stake, 1994, Yin,1994).

Criticisms of case study research usually relate to the idiosyncratic nature of a case,

with the argument that case studies cannot deliver the kind of generalisable data which more positivistic, quantitative approaches can produce. Lincoln and Guba (1985) prefer to replace the concept generalisability with 'transferability' as the latter term more accurately expresses how cases can be transferred from specific contexts to illustrate particular differences and similarities between cases. With INTERACTS, the data collected had to be transferred to a wider policy context, through a method which involved comparison of cases.

For social policy researchers the case study has distinct advantages.

> All who wish to understand voluntary action will need to balance the parochialism of the case study approach against its attention to process and dynamics. Dense, located detail, critically analysed, is as important as thinner, if numerically significant outputs. This is a message for all who study voluntary organisations, whether as policy makers, practitioners, researchers or students. (Scott et al: 2000)

The work of INTERACTS was intended to generate policy implications and recommendations by showing the empirical reality of science shop work 'on the ground.' If current policy does not connect with empirical experience then policy needs to be reviewed in the light of the evidence produced from this Project.

Yin (1994: 44-51) in particular argues for multiple case studies, as in this INTERACTS project, to be considered not in terms of a 'sampling logic' attempting to assess and quantify the incidence of phenomena, but rather in terms of a 'replication logic' akin to multiple experiments on the same type of subject. Cases are chosen to predict similar results from similar circumstances (literal replications) as well as to produce contrasting results from predictable differences of circumstance (theoretical replications).

As researchers we have collected information with a structured outcome as an objective, through gathering data via semi-structured interviewing using a standardised interview schedule, and using a common framework for analysis. The research was been designed to make the information accessible and coherent, so that both common and unique features could emerge, along with explanatory discussion on the wider issues of impact and implication for policy. (Hall & Hall: 2002)

Donmoyer (2000: 61) notes a key advantage of the case study method when he states that 'case studies can take us to places where most of us would not have an opportunity to go.' Similarly, Stake (1986) believes the role of the evaluator is to

provide narrative accounts that provide vicarious experience. This report can therefore seen be considered as providing access to a variety of community experiences, a *window on the localities* of science shops in action. The account of unique situations and individuals provides models for action, while the *rich data* collected adds nuance and subtlety to overarching theoretical perspectives.

3.3.1 Interview Questionnaire

Each case was an example of research collaboration with an NGO which had been mediated by a science shop. Each was based on interviews with all the main key participants on two levels – those who had been directly involved in carrying out the research (Level 1) and those who had a view on the policy implications of the activity, such as university deans or organisational managers (Level 2). In this way it was hoped to represent the overlapping spheres of university, science shop and NGO activity, similar to the model of the Triple Helix of university-industry-government relations. (Leydesdorff, 2001)

In order to ensure a broad comparability of cases, a common methodology was devised, with interview schedules (Appendix 2) derived from the issues which partners decided were central to the understanding of science shop work. So, for instance, the NGO respondent, researcher(s), supervisor and science shop mediator were asked about the main research questions and methods, findings and recommendations and about the organisation of the project – how it was initiated, channels of communication, budget and timescales. The outcomes of the research were also investigated, in terms of usage and publication, long term benefit to the organisation, and relation to the wider objectives of the organisation. These policy issues were also explored with Level 2 respondents, although with the diversity of roles involved, it was more difficult to devise questions which could be asked across all 6 countries. In order to reflect the more general thrust of the research on science policy, some of the questions asked at this level were about science and society issues rather than about the specifics of the cases, with which respondents may have been unfamiliar.

A major purpose of the study was not just to show whether negotiated applied community research could be effective – but to examine the case for the intermediary organisation in facilitating such research. So direct questions were asked about the role of the science shop and about the advantages and disadvantages of the three way relationship between science shop, community group and researcher.

Open ended questions were used in all instances to enable interviewers both to probe on the development of the particular case being studied, and to permit flexibility

between cases (as national contexts are so different). Careful consideration was given to the interviews being conducted according to appropriate ethical procedures as specified by professional social research associations. The following instruction was given by the designers of the methodology:

> Before any interview take place, it is important to gain the **consent** of the participants for this research to be used by INTERACTS and for possible future publication. Please enquire whether they wish themselves and/or their organisation to be anonymous – and a pseudonym to be used.

3.3.2 Sample

It was agreed that partners would study cases of NGO-Science Shop interaction that were:

- *Complete* (so that activity was finished and impact could be assessed)
- *Recent* (so that those interviewed could recall fairly accurately what happened)
- With *Impact* (so that cases contributed to knowledge or to usage)

It was also agreed that case studies would focus on the three main actors:

- *NGOs* (those whose activities cocnerned the environment or social welfare and health)
- *Researchers* (students and/or supervisors)
- *Science Shops*

The option of including a non-science shop example of NGO-university collaboration was considered, but eventually rejected on the grounds that such cases would introduce too much variability to allow valid conclusions to be drawn regarding the reasons for their impact.

Instead, it was decided that the science shop examples from each country would include one case from a science shop / mediating organisation different from the partner's own science shop. Thus each partner agreed to complete three cases, one of which would be from a science shop other than their own. It was felt that this would supply further comparative perspective to the study and increase the validity of the research – so that the findings would be less heavily biased to personal experience and justification of action. The extension of the sample would enable the inclusion of questions and issues which the INTERACTS members might not have encountered in their own science shops and might provide further insights into negative or difficult problems which could arise.

It was suggested that a minimum of 6 interviews per case would be required:

- with those directly involved in the research, 1 each from NGO, Researcher,

Science Shop (level 1)

- with those involved in the research at a policy level, 1 each from NGO, Researcher, Science Shop. These might include the NGO manager or regional network coordinator, a University Dean with responsibility for curriculum and /or a research profile Science Shop manager (level 2).

In the event, it proved difficult to interview three level 2 participants for each case, because the science shops were all at different stages of development – with the level 1 science shop co-ordinator often being the only science shop worker. Further, not all the science shops were university based, while policy makers in academia who were willing to participate were not easy to locate.

3.3.3 Reliability and Validity

A number of background discussion papers were circulated by the UK team to help ensure a common understanding of the methodology was being proposed, and to provide the opportunity for response by partners. One paper made the following comment:

> *[Case study research] may not have the high generalisability (external validity) of a probability-based sample survey, but it will have high internal validity, in that it probes the processes and shifting views of our work, as well allowing the voices of participants to be more clearly heard. It enables us to research the perceptions of reality of the participants, which is what we are about. This may require the collection of information specific to the particular case, as well as the collection of information consistent across cases. As with all qualitative research, this means that the data will have lower reliability than that produced by structured survey research, but it will have greater validity in that it is related more closely to our understanding of process.*
> *(Hall I, INTERACTS discussion paper 6/02/2002)*

Was the validity of the research weakened by a lack of 'objectivity'? It was recognised from the outset that all the researchers shared a bias – they were committed to the ideals of science shop activity and to its promotion. Such researcher involvement requires awareness of 'positionality' – of the positioning of the researcher within a wider structure which relates to how they have come to understand knowledge as well as how they have come to produce it (Rhoads, 1997: 17). For social scientists today, awareness of the role of the researcher in producing data has overtaken concerns about the elusive standard of 'objectivity' when values and positioning are made explicit. However, it was hoped to avoid undue bias in the interview itself by adherence to the common interview schedule and by standardising the introduction (Appendix 3).

Partners were also required to keep a full transcript of the interviews in the national language as a reliability check on the data and the questioning.

Validity was also strengthened by all partners being required to complete a pilot case to test the questionnaire before the main study began. This produced feedback via email on whether the questions were 'working' – i.e. they were unambiguous and provided information on science shop activity which was central to the study. Level 2 questions were found to be particularly problematic. Adjustments were made as a result of feedback from this pilot stage – although it is fair to say that in the final study, the level 2 questions were the hardest to deliver in a consistent way. National differences at the higher policy level meant that interviewers often had to rephrase the questions to make them meaningful.

3.3.4 Reflection

All partners were advised to keep a research diary to record their experiences of the pilot and the main study. As a circulated paper noted, 'reflection in action' is the process of thinking about what you are doing, as the work progresses and is distinct from "reflection on action" which is a *post hoc* activity – 'stop and think' when the action is no longer current (Schõn, 1983).

> Such reflection in action, Schõn argues, provides a way of opening thought up to possibilities which might otherwise be blocked off. It helps produce flexibility in finding solutions when objectives are unclear or problematic and so produces improvisation which is thoughtful rather than reactive.
> (Hall I & Hall D, INTERACTS discussion paper, 20/02/2002)

For the INTERACTS partners representing different cultures and experiences, reflection **in** action was crucial, if not always comfortable, to finding solutions which were creative and scientifically sound, and which represented the commonality and the diversity of the cases. The interview schedule, for instance, was modified after extensive consultation and reflection by partners, and the analytic framework was similarly revised.

Reflection **on** action was also encouraged, and a questionnaire was circulated to all partners asking them to reflect on what they felt had been the strengths and the problems with the case study research. One partner noted a particular problem with administering the research, that it was

> *time consuming (especially due to translations: we needed translated questionnaires and then transcriptions of the interviews in [the native tongue] and again citations in English), we spent more time than the allocated time (and*

budget) for this WP. [The problem] is not actually related to the form of the questionnaire, but to the whole research procedure application in the context of non-native English speakers.

These comments raise particular concerns for the conduct of cross-national qualitative research, which perhaps need to be addressed when research is being designed, timescales developed and budgets assigned for European projects. However, the partner who raised the problems also felt that there were advantages to the method,
but I think it facilitates analysis and comparison of cases, and provides also sufficient in depth information to "feel the flavour" of specific experiences.

3.3.5 Case Study Reports

The case studies of the different partners and countries were analysed according to a common agreed framework applied to the cases in terms of a fact sheet summary, the process of project origination and negotiation, the aims and objectives of the research, data collection and analysis, the outcomes, impacts and usage of the research, and participants' evaluations.
This was preceded by a section introducing the science shops and the selection of case studies, and followed by a further section on policy evaluation. The policy section considered the application of the case studies to policy formulation from the points of view of the three main actors involved, the NGOs, universities, and science shops.

The final case study reports were prefaced by an executive summary, and an introductory section on case studies and methods. This current paper is a revision and extension of the common introduction on case studies and methods.

3.4 Scientrometric analysis of case studies – methodological considerations

The research in this subcontract to the INTERACTS project addressed the question of the external visibility of Science Shop work in terms of communications which reach beyond the local context of the participants. In addition to the question of the effects of this specific type of communication in terms of publications, institutional development, and curriculum development, it is a study the communication of the results in the press, the popular and grey literature, and other means of communication *insofar as retrievable on distance through the Internet*. This is an important limitation because projects and authors may be visible in other respects, which are considered more important by the Science Shops. The Internet provides us with a specific lens that

enables us to provide feedback on an increasingly important aspect of the visibility and social impact of the mediation.

Each INTERACTS partner provided three detailed case studies from the perspective of the local Science Shops. These 21 case studies were selected by the respective partners as “best practices” on the basis of a number of criteria.

The methodology of the scientrometric analysis can be summarized as follows:

1. The first full drafts of the case study reports (available as of 19 January 2003 or shortly thereafter) were scrutinized for external references, names of authors, websites and other information that can be accessed from a bibliographic point of view.
2. Each of these leads were followed-up using the *Science Citation Index* and the *Social Science Citation Index* for the scientrometric evaluation, specific webpages of authors and institutions, webportals of newspapers, Amazon.com and its national derivatives (like amazon.co.uk and amazon.de), and the integrated library system of the Netherlands (PICA) in the case of retrieving books, as well as the *AltaVista* Advanced Search Engine for identifiable clues like the ones mentioned. The *AltaVista* Advanced Search Engine was used among the many possible search engines because of its use in other webometric research (and therefore the availability of software and routines) and its option to search for different domains using Boolean relations and specific time frames (Leydesdorff, 2001).
3. On the basis of these searches a bibliographic/infographic profile is sketched for each of the 21 case studies describing the main researchers involved, the output, the scientific institutions, and the role of the Science Shop in the mediation. Conclusions in the different dimensions of potential impact like higher education, scientific publications, newspapers, etc. are elaborated and policy recommendations for enhancing the visibility of Science Shop research are made.
4. Preliminary conclusions were reported to the internal meeting of the consortium at Innsbruck (Austria), 7-9 March 2003, as a contribution to the formative evaluation. An initial version of the research report was circulated among the contractors in May 2003 for comments.
5. In response to the initial report, it became clear that the retrieval of information about the researchers and clients in the case studies of Vienna could mean a breach of the guarantee of anonymity provided by the research team that analyzed the case studies. Although the information was retrieved at the Internet on the basis of the previously anonymized reports only, we agreed to further anonymize paragraph 3.3 in this meta-evaluation. The format of this section therefore differs in some respects.

3.5 Scenario workshop methodology

Work package 5 of the INTERACTS project deals with the future expectations of and the perspectives for cooperation between the four actor groups NGOs, intermediaries, scientists and politicians, concerning the "improvement of the dialogue between science and society". A workshop bringing together all actor groups was envisaged. The obvious methodological approach to choose was an adaptation of the European Awareness Scenario Workshop method (EASW).

3.5.1 What is an European Awareness Scenario Workshop?

A European Awareness Scenario Workshop is a good tool to support and facilitate active participation of people from across society and across different interest groups. The EASW methodology was originally developed by the European Commission's Innovation Programme in 1994 as a way of promoting awareness and planning for sustainability in the urban environment by bringing together participants from different backgrounds – technology experts, policy makers, residents, and employers – to consider future scenarios and to discuss how to overcome barriers to success.

The European Awareness Scenario Workshop Method allows the direct participation of four social groups from civil society. The setting of a EASW Workshop offers the participants a direct opportunity for exchanging and discussing their points of view, doubts, suggestions and wishes regarding a particular topic or problem with experts and decision-makers. Furthermore it is a tool for promoting dialogue, furthering involvement and for managing a constructive discussion between various actor groups. The Collingride dilemma also supports this choice of method. It states that: The attentiveness of society for a certain problem or future development reaches its highest point at a time when control or influence of society on this problem is not possible any more. As a consequence, the timely involvement of the citizens in decision-finding processes, with respect to problems they are concerned with, can increase the chance of timely intervention and control.

3.5.2 What is a Scenario Workshop?

Based on the standardized European Awareness Scenario Workshop methodology "Pax Mediterranea" developed a first adaptation of the methodology explained in detail in the "INSTRUCTIONS BOOKLET" – an INTERACTS Methodology for group discussions and analysis: an adaptation of the EASW and BASIS Public Participation Tool (for full details see booklet)

Bases on this booklet “The FBI Centre” further developed and adapted the methodology to the specific needs of the INTERACTS project partners. This further step was necessary as the majority of the project partners have not been experienced with the EASW methodology and needed a very basic tool, which could easily be adapted to their specific boundary conditions. In addition it proved to be necessary to have a training unit on the EASW methodology which took place at the third internal INTERACTS project meeting in Rinn, (Innsbruck – Austria) prepared and conducted by Gabriela Schroffenegger from “the FBI Centre” and Alain Labatut from “Pax Mediterranea”.

The central element in the Scenario Workshop approach is dialogue aiming at moderating the participants to develop their own visions related to a specific focus question and their specific area of interest, and through discussions enabling the participants to identify and develop suggestions on options to achieve their vision.

The main aims of a Scenario Workshop:

- It helps raising awareness of future problems in the community.
- It helps developing a common definition of a desirable development.
- It allows discussions with different social groups about obstacles on the way towards a future worth living.
- It allows to identify and discuss the differences and similarities of problems and solutions as perceived by the different groups of participants.
- On the one hand a Scenario Workshop helps to develop and generate utopian ideas. On the other hand it allows to plan first steps that can be realized in the near future or even to develop an action plan for the implementation of solution trails.
- It supports attempts to work out solutions together.
- An optimal result would be the agreement of all participants on a desirable development with respect to the workshop topic.

3.5.3 Basic Scenario Workshop Tool - BSWT

3.5.3.1 The Adaptation of the EASW Methodology and the Rational in Detail

Selection of Participants / The Interest (Role) Groups

With respect to the key stakeholders in the INTERACTS project it was decided to have the following four role groups to be present at the Scenario Workshop:

1. NGO representatives
2. Politicians/decision makers

3. Universities/researchers
4. Intermediaries

This subdivision is necessary to balance the various interests of the different role groups and to include them on an equal basis. All participating role groups are regarded as experts on an equal basis with knowledge of the problem and solution trails.

Time Frame

An EASW is scheduled to last two days in order to provide enough time to develop the scenarios and plan the activities.

The partners of the INTERACTS project decided to shorten the time frame of the Scenario Workshop to one day by combining and shortening intermediary stages.
The rationale for this decision lay in the realistic assumption that for politicians and university professors a workshop organised by a non-official institution like the Science Shops would not warrant abandoning their day-to-day activities for two whole days. So, in order to prevent getting only second and third ranking representatives to attend, it was decided to contract the time frame.

The second reason for shortening the time was the broadness of the topic. It was clear from the start that even two days would not be enough to discuss the topic exhaustively, rather, the workshop would only serve to discover ideas, compare them and, at the most, agree on first steps to be taken in consultation with each other. The hope was to put into motion a process of dialogue and networking which has to be continued longer term on a regional level.

Development of Scenarios

Within an EASW the role groups develop a best-case (positive) and a worst-case (negative) scenario. For practical reasons, time constraints and also with respect to the general aim of the Scenario Workshop to investigate on the improvement of the relationship between university and society most partners decided to focus only on the best-case scenario. Even in the case a worst-case scenario is developed it is just to contrast the best-case scenario. Experience shows that people more easily develop a worst-case scenario compared to a best-case scenario. It supports developing the best-case scenario.

Provision of Scenarios and Chairing of Working Groups

In the classic version of an EASW, the participating groups are being confronted with

given scenarios, in the case of urban planning on a scale of more or less technological development and more or less personal initiative.

The given topic could, of course, also be modified. Most INTERACTS partners, however, did without pre-given scenarios and chairing of working groups. This is due to the perceived high expertise of the invited participants and the small numbers. It was considered too unwieldy and also patronising to chair a working group of city councillors, university professors, high-ranking civil servants etc. The people invited knew best what they wanted to discuss and wanted to do that in an unrestricted manner. There would have been little point for the organisers to construct future scenarios, only to have them rejected and start the working process on a negative note. We wanted to find out about new ideas, new visions and not hamper them with too tight a framework. The project workers of the Science Shops, for whom INTERACTS is their second project on science transfer via intermediaries, think they know from experience and from their research work with this model in its various forms and development, how the dialogue between science and society via intermediaries can work, but they do not want this knowledge to dominate to such an extent, that other possibilities are not being considered any more. We as workers of the Science Shops are keen to discover ideas hitherto not considered in our work and the best way to do this is not to channel the participants thinking into given scenarios.

3.5.3.2 Main Elements to be included in the Basic Scenario Workshop Tool to conduct a Scenario Workshop

A Basic Scenario Workshop is arranged as a combination of group and plenary sessions. In the course of the Scenario Workshop the participants will go through a combination of different activities: brainstorming, development of positive scenarios, group and plenary presentations, development of actions or strategies in order to achieve a certain situation, dialogue and negotiations.

Introductory Session in Plenary

The Scenario Workshop starts with an introductory session in plenary, welcoming the participants and explaining them about the programme of the day.

Presentations of the Organiser

These presentations are explaining the wider settings and the aims of the workshop. There is also room for a short presentation of the organiser organisation and for any material the organiser considers as helpful in the frame of the workshop.

Group Session: Development of the Future Scenario within the four Interest Groups (Role Groups)

The participants develop and discuss within their role group a positive scenario related to the scenario workshop focus question (the prospective question) reflecting their interests and future expectations. To support this process it is helpful to provide the groups with handouts to help develop the scenario, pointing out the main questions to ask and what steps to take.

Each role group develops one common future scenario reflecting their interests and future expectations.

A minimum participation of four persons per role group is recommended. The maximum participation per role group should be limited to eight persons to give the individual participants a chance to discuss and bring forwards ones view.
It is recommended to have around one and a half hour of discussion time.

Plenary Session: Presentation of the Results of each Interest Group (Role Group)

The individual scenarios are presented by on spokesperson each and are compared with each other. Thus one can learn to understand the ideas, fears and wishes of the participating role groups and identify common ground and conflicting issues. The discussion stimulates mutual understanding. Individual motives, backgrounds, intentions become visible and decisions are made transparent and comprehensible.

Plenary Session: Identification of common Themes derived from the four Scenarios

In a first step the participants draw up a list of common topics and themes derived from the four scenarios. In a second step this list gets whittled down to four themes to continue working in the thematic groups.

Group Session: Division of the Participants into four Thematic Groups

Here the participants are divided into four thematic groups, and the aim is to discuss and develop means of actions towards the chosen theme for further discussions. Each thematic group consists of participants of all role groups. Thus the scenarios from the individual groups are present in each thematic group. Each thematic group gets supplied with a handout focusing on the suggested questions and including a coordinate axes schema supporting a structured presentation of the findings.

A minimum participation of four persons per thematic group is recommended (one representative of each role group). The maximum participation per thematic group should be limited to eight persons to give the individual participants a chance to

discuss and bring forwards ones view. It is recommended to have around one and a half hour of discussion time.

Plenary Session: Presentation of the Results of each Thematic Group

Plenary Session: Plenary Discussions of what to do next - drawing up an Action Plan (a Master Plan)

This part of the participatory workshop brings us back to reality. Based on the results of the thematic groups a plan is developed for the implementation of the results, i.e. what each participant or participating group can contribute to the realisation of the scenarios. This last step opens up perspectives for concerted action, shows practicable ways for implementation and can go as far as developing a strategic action plan. In some cases an actual action plan is developed pointing out responsibilities of the different actors, and in other cases, the scenario workshop ends with several suggestions to change a given situation, but without pointing out responsibilities.

Feedback Round and Farewell

Follow up Meeting

A Follow-up Meeting some weeks after the Scenario Workshop is recommended with the aim of discussing workshop results and next steps.

3.6 Comparison of Case Studies – methodological approach

The cross case study analysis has been developed based on the inductive method; themes and issues have been identified by going though the policy evaluation chapters in all the case study reports. Basing the cross analysis of the case studies on the inductive method has been possible due to the design of the research, which was (as explained in Hall & Hall, 2002) to make the information accessible and coherent, so that both common and unique features could emerge, along with explanatory discussion on the wider issues of impact and implication for policy.

The cross case study analysis has been developed by Andrea Gnaiger, FBI, Michael Søgaard Jørgensen and Søsser Brodersen, DTU.

The cross analysis has been developed in four steps:

1. Reading through all the policy evaluation chapters in the case study reports, and in some cases reading through the whole reports.

2. Issues and arguments were identified and grouped under themes (individually for each case study report)
3. Themes, issues and arguments from each case study report were combined across the case studies
4. The three perspectives (NGOs, Research and Teaching system, and Science Shop) were written based on the themes, issues and arguments identified.

Add 1)
In order to ensure the unique features in the case studies, each chapter on policy recommendations were carefully read through and all issues, aspects and arguments were written down. Given the researchers different educational background, it was agreed that FBI worked with the cases focusing on social issues and DTU worked with cases focusing on environmental issues. This meant that FBI was responsible for the UK case studies, and the Austrian case studies, whereas DTU was responsible for the Romanian case studies, the German case studies, the Spanish case studies and the Danish case studies.
Before going through all the case study reports, we agreed to go through the UK case studies together in order to see if we would manage to identify the same issues and aspects. Since this was the case, we started reading through and identify issues and topics in all the case study reports.

Three perspectives (e.g. NGOs, Teaching and Research system and Science Shops) were identified as the general division in the policy evaluation chapters, so we agreed to continue with this division in the analysis. This to ensure all actors views and arguments were included in the analysis.

Add 2)
The next step was to identify issues, topics and aspects in each of the case studies and to divide them into subsections with headings indicating the issue pointed out. This meant that the topics emerged from the case studies and were not biased or predetermined by the researchers making the analysis.

Add 3)
When each case study had been analysed separately and topics and issues been identified, a cross analysis could be made. Identical topics and issues were grouped together and topics and issues only mentioned by one partner grouped separately. It was noted who had put forward the statement. In order to ensure no topics or issues were missed, the cross combination/analysis was done both by FBI and DTU individually, and thereafter compared.

The result after this phase was a document containing all issues and topics identified in the case study reports, divided into headings indicating the topic of the points put forward, and which partners had raised the issues and topics.

Add 4)
The last step was to write the final cross analysis chapter. This was done on the basis of the document worked out in step three. To ensure not to loose the partners points and the unique features in the cases, points and issues are put forward by using the partners own wording in the argumentation. Whenever an argumentation or issue are put forward it is stated by who and which page number the argumentation can be found the case study reports.

The cross analysis of the case studies has been discussed and commented on by all partners and modified in relation to these comments.

3.7 Comparison of the workshops – methodological approach

In the given case the participatory workshops have been designed for the purpose of research with respect to a specific question, but the composition of the participants and their acting in role groups and thematic groups aimed at mirroring the social conditions as they are. The method applied is therefore established between an interview and a contents analysis.

The analysis in the sense of working out similarities, differences and unusual features is restricted to the contents as it is not appropriate to conduct a linguistic analysis in a multilingual European setting.

“In some cases sociologists investigate the social behaviour not in a direct way but through its outcomes. To tap relevant information in historical and contemporary material they often apply the contents analysis. This method can by applied to nearly all kind of written communication: such as letters, diaries, autobiographies, laws, lyrics, newspapers and even pictures, providing rich information about the behaviour of mankind. The contents analysis allows to organise and to summarize the manifest contents as well as the latent contents of the communication in a systematic way. (Calhoun 2003)

The flip charts of the participatory workshops can be regarded as “the minutes of the verbal reactions of the interviewees to verbal stimuli”. “ The empirical analysis of the contents focuses on documents of social processes, on results of activities of single persons or groups…. These materials are in general not being produced just for the

purpose of a contents analysis, but they mirror social facts which existed or exist independent and uninfluenced of the intention of the research." (Kromrey 2000)

The results of the participatory workshops represent the remarks produced by the participants in the role groups or thematic groups in response to provided questions and therefore equate a group interview.

The discussion process within the working groups without the participation of the moderator seems to represent even deeper and more genuine the opinion of the group compared to a regular group interview.

In the plenary sessions of the workshop the opinions of the groups – the opinions of the individual role groups as well as the opinions of the individual thematic groups – are ranked by the participants themselves. The ranking and the interpretation of the underlying communication are therefore anticipated by the participants themselves.

Based on a schema drawn up by Teresa Rojo (Pax med) all partners delivered summaries of her national participatory workshop. The comparison of the workshops is based on the information provided by the partners in the workshop summaries with one exemption. In the case of the Spanish workshop the summary was not available at the time the cross comparison was drawn up. About that the information needed had to be taken from the detailed Spanish workshop report.

Following the scheme provided the individual aspects have been compared in the following manner. The same results with regards to contents or similar results just formulated differently have been summarised and ranked. Thus the results described most frequently by the partners are discussed in the first place emphasizing their importance. The second frequent results have been discussed in the second place etc. Finally it was tried to grasp all individual results of the individual workshops in a way that the essential of each country is covered in the overall view. In this way all aspects as listed in the schema have been dealt with. Results or opinions deviating of the majority have been also recorded and described. The same is true for outstanding details. To make visible the differences quotations have been used as much as possible.

Each chapter ends with an overview summarizing the results with respect to their importance as expressed in the sum of all national summaries and with respect to the frequency comparing all workshops.

This comparison is aiming at providing an overview on the seven participatory workshops with respect to the thematic main focus, the organisation, the course of the workshop and the results. It will be particular of interest for readers who want to get an impression of the workshops without reading through all detailed individual reports.

Of cause the common aspects could be described in a comprehensive manner. The deviations from the majority and the unusual features are only included and discussed selective and exemplary. Of cause the selection process was aimed at obtaining objectivity but every selection also re-mirrors the personal view of the author.

The detailed reports are therefore recommended to the interested reader to deepen their understanding.

3.8 The process of policy option development

One of the objectives of INTERACTS have been to develop policy recommendations, which can help strengthening the role of science shops as part of the future Science Society development.

This objective was described in this way in the Technical Annex of the INTERACTS project:

"Develop policy strategies for improving conditions for future co-operation between NGO's, researchers and intermediaries like science shops. The main points to be addressed are:

- *The possibilities for democratising Science & Technology policy decision making*
- *The access of NGO's and citizens to participate in Science & Technology decisions*
- *The conditions for intermediaries like science shops*
- *The conditions for university teachers and researchers to work with NGO-initiated and NGO-related topics as part of their research and teaching activities."*

The following paragraphs describe the methodology of the policy recommendation development.

The option development has been based on different processes:

- an *analytic* approach, where we define issues to be addressed, consider objectives for the future and think about options that might support these objectives
- a *creative* approach, where we more think about what we think is needed in order to support the development of citizens participation and intermediaries like science shops

Options should be evidence-based

The options are *evidence*-based. This means that they are based on the state-of-the-art report about the role of NGOs and science shops in the partner countries, the case studies and the scenario workshops.

Justifying issues and options

During the development of the issues and options for policy recommendations we have focused on *justifying* our issues, objectives and options by referring to policy documents (EU or national) and *about readily available options.* Policy development is understood as *a process of coalition building* at different levels

The steps in the policy option development

The policy option development has followed these steps:

- Each partner has developed ideas for policy options at *local, national, regional and international/EU* level *based on the local experiences from own case studies and own scenario workshop.*
- The cross-analysis of the case study reports and the scenario workshop reports have pointed to policy issues
- An survey of *relevant EU policy papers* have pointed to issues, where science shops can be seen as one of the means for fulfilling policy goals
- All these inputs have been merged into a chapter with policy options for the draft final report
- Feedback to policy issues and options have been given at the international dissemination events of INTERACTS in Paris during the European Social Forum and at the JRC organised conference Interfaces between Science and Society in Milan, both in November 2003. Feedback has also been received from the international network of science shops, Living Knowledge as part of the ISSNET thematic network activities.
- Based on this feedback the proposals for policy issues and recommendations have been revised.

The structure of a policy option

The policy recommendations have been given the following structure:

- The policy issue written as a question
- The Problem: Background;
- Evidence from INTERACTS
- Policy Options

Cross-national similarities and differences

The national ideas for policy options in the national summaries reflect the cross-national similarities and differences within the Science-Society discourse in the partner countries. These differences and similarities have been reflected in the cross-analysis of the case studies and of the scenario workshops and the development of policy recommendations.

Policy recommendations based on prerequisites and barriers

Developing policy options can be a difficult process because one might be a little blind to the prerequisites in ones own context. This is like when one learns about ones own country by visiting other countries, because one normally does not think about the prerequisites of the daily practice. In the development of policy recommendations the focus has been on:

- What are the *prerequisites of the impact of science shops* of today and how can these prerequisites be developed further in our own countries and in other countries
- What are the *barriers to the impact of science shops* of today and how can these barriers be reduced in the future.

4 Cross Analysis of Case Studies

This chapter is divided in three sections. These analyse the Science Shop experiences from the national case studies as seen from the perspective of NGOs, universities, and the Science Shops, respectively. Science Shop projects are about interaction between different actors, but the shaping of this interaction interacts with the conditions of these three actors: NGOs, universities, and Science Shops.

4.1 The NGO Perspective

4.1.1 The problems addressed in the case studies

Nineteen of the twenty-one projects analysed in the INTERACTS national case study reports were based on requests made by NGOs or civil society groups to the Science Shops., and two of the twenty-one cases were initiated by a Science Shop and not by a NGO.

The national case study reports shows NGOs are approaching Science Shops for different reasons and with different ideas and expectations. The national case study reports show that the initial step to consult a Science Shop is either based on problems they experience, observations they make, ideas, desires or needs they have.

NGO/community initiated projects: Type of knowledge process wanted	**Number of cases (field of case)**
Scientific documentation of known problem to convince authorities about need for action	*DK:* One case about an environmental problem. (Title: 'Biomanipulation in shallow eutrophic lakes – a study of food web interactions and lake equilibria') *Romania:* Two cases about an environmental problem. (Titles: 'Evaluation of the quality of drinking water supplied in the city of Iasi', and 'The impact of wastewaters resulted from the industrial production of yeast on the river of Siret') *Spain:* One case about an environmental problem. (Title: 'Health and environmental hazards at cement kilns waste incineration')
Enhancement of knowledge around a topic as part of NGO activity	*DK:* One case about the topic of bicyclism. (Title: 'What is a bicycle? – a social constructivist analysis of the possibilities of promoting the use of bicycles') *Romania:* One case about bio-diversity (Title: 'Project Vladeni 2000- Biodiversity Conservation in the Wetland Vladeni (Iasi County- Romania')
Research of impact of governmental project	*Germany:* One case about impact of infrastructure project. (Title: 'Tiergarten – Tunnel')
Access to knowledge from	*Romania:* One case about an environmental problem. (Title: 'Evaluation of the

governmental organisations/institutions	quality of drinking water supplied in the city of Iasi') *Austria:* One case about social services for people. (Title: Evaluation of a series of lectures on precaution against heart disease for Turkish migrant women in Tirol')
Development of solutions to a problem	*DK:* One case dealing with storage of organic food. (Title: 'Organic food in the day care centre Vognporten – with special focus on storage and local supply of fruits and vegetables') *Spain:* Two cases, one case concerning the development of green plan for city. (Title: 'Urban Ecology Strategy Design, Seville 2025'), and one case about housing of minority and vulnerable group. (Title: 'Architectural Study for Romany Community, Los Perdigones')
Evaluation of NGO or community service and project	*Austria:* Three cases concerning social services, and one case concerning a research project about empowerment of a community in order to improve the community's living conditions. (Titles: 'Volunteers as Buddies for Mentally Disordered Persons', and 'Children Poverty in Austria, and 'Analysis on customer satisfaction of the aggrieved with respects to mediation in penal matters', and 'Mega Settlement) *UK:* Two cases concerning social services. (Titles: 'Lakeview Day Centre', and 'Midlands Befriending Service')
NGO wanting to develop own services	*Austria:* One case concerning the social conditions for youth. (Title: 'Children and young people in the Lungau: Between participation and apathy') *UK:* One case concerning social services. (Title: 'Benington Hospital')

Table 1: Type of knowledge process wanted in community/NGO initiated projects

In some of the case studies initiated by NGOs the focus of a project is developed further through the interaction between the NGO and the involved researchers and/or students. This happens during the initial planning or during the conduction of the project based on the need or the idea put forward by the NGO.

Not all requests from NGOs approaching Science Shops lead to research projects. Many requests by NGOs can be answered by consulting, supplying the requestor with literature on the topic of interest or arranging contacts with experts in corresponding fields (Vienna, page 97). This is also the case in some of the other Science Shops.

Some of the national case study reports reveal that NGOs might have expectations to the results, when they approach a Science Shop:

- Research and methods which are simple, so that findings would be transferable throughout the country (UK, page 63)
- Research that provides information that feeds into changing practice (UK, page 63)
- Results that can be applied to practice (UK, page 71; FBI, page 79)

In some cases the NGOs have no or very vague expectations to the results. They might only have heard about the possibility to get researched-based help.

Two of the investigated cases in the national case study reports were initiated by a Science Shop and not by NGOs. All these cases are initiated by independent Science Shops.

Researcher/Science Shop initiated projects: Type of knowledge production	Focus/number of cases
Facilitating networking with in organisations and between them and others	*Germany:* One case which dealt with facilitating networking and communication between NGOs, and developing communication tools. (Title: 'Creative Committee')
Developing NGO knowledge about funding opportunities	Germany: One case about seminars on how to build up a foundation and network. (Title: 'Foundations for Environmental Protection and Local Agenda 21')

Table 2: Type of knowledge production in Science Shop initiated projects

4.1.2 Important aspects for NGOs in the co-operation with a Science Shop

Access to free or affordable research

For some NGOs it is important that the Science Shop service is free (Romania, page 73, 75-76, DK, page 110). Some bigger NGOs might be able to pay for some of the costs of the services, but it is important that the costs are affordable, since NGOs have scarce resources (FBI, page 79; Vienna, page 112).

Access to impartial and independent research

Another important issue mentioned in the national case study reports was the independent, external, impartial researcher. This was expressed in the case studies as follows:

- Quality assurance through an external evaluator/ researcher (UK, page 64; Vienna, page 28, 70)
- An external review allows the voice of the service users to be heard (UK, page 79; Vienna, page 76)
- It was important to the client organisation to have an independent external expert to conduct the research (view from the outside of the organisation). A different view, were considered as enriching (FBI, page 78; Vienna, page 117; Romania, page 75)
- The Science Shop as an organisation that has the role of an external expert for the NGO (Romania, page 75)
- Projects done through the university structures are seen as scientifically impartial. The organisations feel that by having projects done through a

university, they feel empowered through higher legitimacy in the political debate, and feel that their arguments are stronger than if they had produced the results themselves. This show the high standing universities might have among NGOs (DK, page 93, UK page 71)

- The United Kingdom cases show that a relationship with a university is of the increasing importance for the survival of NGOs (UK, page 78)

However, it was also mentioned in one of the United Kingdom cases that there were problems by having an external researcher working in the NGO, because the student did not understand the system or the culture of the organisation (UK, page 72-73).

4.1.3 Barriers to co-operation

The national case study reports show that a barrier perceived by NGOs for co-operating with a Science Shop can be whether students are capable to meet the needs of the NGOs. One of the Vienna cases mentions doubts from the client (NGO) to what extent a masters thesis would be able to yield useful results in terms of findings, which would really enhance the knowledge of the NGO and provide useful information for the daily work (Vienna, page 110). The results produced by the students resolved the problem and satisfied the expectations of the NGO by far. The clients were positively surprised by the commitment of the students, their way of working and by their findings (Vienna, page 111).

The big student commitment is mentioned in several of the national case study reports. In the Austrian case study reports for example, the students have been described as very ambitious, engaged, active, and determined (FBI, page 82; Vienna, page 111). In the United Kingdom case study report for example, the independence and critical awareness of student researchers was in addition pointed out (UK, page 79).

Another barrier, mentioned in the Danish case study report, is that when NGOs approach the Science Shops with project proposals, they cannot be sure, whether or when some students decide to work with their project proposal. This can have an impact on how many NGOs that approach the Science Shop and with what type of problems they approach the Science Shop. For some NGOs it seem to imply that they approach the Science Shops with less urgent, but maybe more long-term oriented and strategic problems (DTU, page 118).

4.1.4 Impact of Science Shops on NGOs:

NGOs perception of Science Shops and of research

In general Science Shops are perceived by NGO representatives as an efficient way to connect universities and communities (for example: Romania, page 81-82). Through mediation of Science Shops NGOs gain access to science and research, which they would not have had if Science Shops had not existed (Germany, page 7; DK, page 109; Spain, page 37; Romania, page 81). It is stated in case study reports that Science Shops are perceived as more accessible than a university department owing to their explicit openness to the public. They are perceived as less bureaucratic, than the university system (FBI, page 78-79; UK, page 76).

Science Shop projects might contribute to an increased awareness of the possibilities and limits of research among NGOs. Through consulting with the Science Shops the clients might become aware of research possibilities and limits (UK, page 87; Vienna).

Contribution to capacity building in NGOs

In the majority of case study reports it is stated that Science Shop projects (or their findings) and/or the co-operation with a Science Shop contributed to the practice of the NGO. In some cases a project contributed to the capacity of the NGOs to carry out their future practice. This impact is not always planned or foreseen in the initial project idea and planning.

As an example, the Innsbruck case study report reveal that scientific results of Science Shop projects are not only broadening the ‘store of knowledge’ of the NGO in general, but can also enlarge the capacity of the client organisation for taking action (FBI, page 78). The German case study report states that although the cases investigated focused on different topics and were conducted by different types of Science Shops (university-based model and independent model) a common impact can be recognised which is the empowerment of small initiatives and NGOs with a focus on “help for self-help” (Germany, page 72).

In three cases empowerment of NGOs are built up through 1) provision/mediation of relevant contacts and knowledge, 2) support for the building-up of networks, e.g. by bringing people together, and 3) provision of organisational frames and experts for workshops and other events, and 4) by showing opportunities for funding (Germany, page 72, 78). In one of the cases in the Spanish case study report it is stated that through a workshop held by the Science Shop, the participants felt empowered to analyse their own societal living and they were able to implement some of the results in their own local communities (Spain, page 36).

The results of Science Shop project may either open new societal discussions or contribute to societal discourses on specific topics and furthermore have an impact on the political sphere. In two of cases in the Danish case study report it is stated, that through co-operation with the Science Shops and students the clients feels capacitated to bring forward the research and its results in order to debate the topic of concern, and thereby impact the political sphere (DTU, page 94-96).

In the Spanish case study report it is stated that result of Science Shop co-operation have been used to lobby with national /regional and local government (Spain, page 63, 69). One of the cases in the Innsbruck case study report shows that results of a Science Shop project could be used by the NGO to influence political decision making on a certain topic (FBI, page 32, 90). This is further supported by one of the case from the Romanian case study report where it is mentioned that the initiation of legislative proposals can be facilitated by the public debates organised as discussions about a Science Shop project. This later statement also includes an aspect pointing to the public relations function a Science Shop has for NGOs (Romania, page 83). This is supported by the Vienna case study report saying that Science Shop projects are promoting the work of NGOs (Vienna, page 98).

Some case study reports show that the NGOs might learn to apply methods or theories used by the researchers or the students. The Vienna case study report show that practitioners (NGOs) can benefit from the theoretical know-how of the student researchers as well as the student researchers benefit from the practical know-how of the practitioners (Vienna, page 111). The German case study report mentions NGOs acquiring techniques to moderate and conduct meeting/seminars (Germany, page 79). This is also seen in one of the cases in the Danish case study report in which one of the NGOs learned how to conduct focus group interviews (DTU, page 28).

4.2 The University Perspective

This chapter discusses the issues related to the role of Universities in relation to Science Shops as it has evolved through the national case study reports. The national case study reports show that Science Shops can contribute to the role and the tasks of the universities in different ways:

- Contribute to the competencies of the involved students and thereby the competencies of the future professionals
- Contribute to the learning methods at the universities by making them more project-oriented and problem-based

- Contribute to new research themes at the universities
- Contribute to the strategic societal role of the universities

Not all case study reports show all these types of impact. The chapter analyses the background of the impacts as described in the case study reports.

In the majority of cases mediated through university-based Science Shops the research was carried out by students supervised by scientists. In most cases the students were undergraduate students in the last two years of their studies. In some of the cases from the university-based Science Shops the research was carried out by researchers in the Science Shop or from the university. In the cases, which involved independent Science Shops (this means outside the universities), the research was carried out by researchers in the Science Shops, or by researchers or students at a university which co-operates with a Science Shop.

4.2.1 Contribution to the student competencies

Science Shops enable universities to educate academia, who are aware of their social responsibility, as they are required by NGOs. This gives Science Shops a key role to play in mediating the relationship between the public and science and in developing awareness about this relationship (FBI, page 10).

An important motivation factor for the students to co-operate with the Science Shops and civil society groups seems to be that the results of their research project are going to be of use for someone so the project not is a desktop study (DK, page 100; FBI, page 81).

Through co-operation with civil society the case study reports show that students might enhance or develop the following skills and competencies through the projects and the co-operation with NGOs:

- Social competences (FBI, page 8)
- Employable skills (UK, page 7; DK, page 104; Vienna, page 98; FBI, page 81)
- Real life experiences (UK, page 76; DK, page 118-119; Romania, page 81; Vienna, page 98; FBI, page 81)
- Communication and co-operation skills (DK, page 111; Romania, page 77; FBI, page 81)
- New knowledge and perspectives (DK, page 104)
- Knowledge and expertise within transdisciplinary research (Germany, page 79; Vienna, page 96)

- How to connect and bring together the various needs and demands of different groups with their rather theoretical scientific background (FBI, page 81)
- Computer skills (Romania, page 93)

The students also benefits from a co-operation with civil society organisations by:

- CV improvement (important especially for students who want to continue with their MSc or PhD studies or want to start a career in the university) (Romania, page 77; Vienna, page 98)
- Usage of the results in projects for the Master's Thesis and publications in peer-reviewed journals (Romania, page 77)
- Acknowledgement of the quality of their work and positive evaluation in students' scientific events (Romania, page 77)
- Science Shop projects may create job opportunities, impact on the career (DK, page 105; FBI, page 81; Romania, page 77; Vienna, page 98)
- Being also more aware that the presentations for the general public may involve an adequate usage of the scientific terminology (Romania, page 77)
- The students earn (in some cases) some extra money (FBI, page 82)

4.2.2 Relevance for university teachers and researchers

As previously mentioned the researchers involved in the Science Shop projects were primarily involved as supervisors for the students. The national case study reports further show that Science Shop projects and co-operation with civil society can have strategic benefits for universities. In United Kingdom, Denmark and Romania Science Shop projects have had impact on curricula at postgraduate and undergraduate level (UK, page 68; DK, page 10; Romania, page 78). For example is it stated in the Romanian case study report that Science Shop activities have contributed to the ongoing modernisation of the curricula and the research by providing flexible modules of learning and project based learning, post-graduate courses, inclusion of Science Shop project results into the regular teaching activity, multi-disciplinary research and formulation of new project proposals (Romania, page 91).

Experience from one of the cases in the Danish case study report shows that Science Shop projects can lead to the establishment of new research and teaching areas. For example, in the case of organic food, several requests from NGOs through the Science Shop at DTU resulted in the establishment of 'organic food' as a research and teaching area at DTU (DK, page 64). This case also shows that even, where the Science Shop besides being a mediator, also has taken the role as incubator for research and curricula development, is there a need for more ongoing discussions and

more ongoing involvement of the scientists in Science Shop projects (DK, page 113-114).

Scientific publications were published in peer reviewed journals (national or international) or communicated at different conferences and seminars. Some of the project data were integrated into the regular teaching activity, and an interest in scientific follow-up topics and new project proposals were formulated based on the Science Shop projects. The Romanian case study report also showed that the social dimension of scientific work was acknowledged. For example, scientists acknowledged that problems cannot be solved without considering the social context in which the problem is to be solved (Romania, page 78).

4.2.3 The role of researchers and students in the co-operation with NGOs

The Danish case study report show that the university students in Science Shop projects in some cases are the producers of knowledge where the civil society groups then has the role as receiver. In other cases knowledge production takes place as a more interactive process between the university (students and supervisor) and the civil society group (DK, page 101).

4.2.4 Barriers for university co-operation between with Science Shop and civil society

Several barriers for co-operation between universities and civil society through Science Shops were identified in the national case study reports. University researchers are under constant time pressure from the university structures: research has to lead to publication and teaching obligations has to be fulfilled.
Some case study reports also showed that it may be difficult to involve scientific staff in Science Shop projects if they do not recognise any publication possibilities in projects done through the Science Shops (UK, page 6; FBI, page 89). Most of the Science Shop projects analysed in these case study reports have contributed to 'grey' literature, but has not achieved any notice within the wider scientific community (UK, page 86; Germany, page 77, FBI, page 89). If Science Shop projects mainly are seen as based on a practical problem rather than on a specific scientific problem researchers might have no scientific interest in Science Shop projects (DK, page 99).

An investigation made within the INTERACTS research project, aiming at analysing how the Science Shop projects (the cases analysed in the national case study reports) were made public, link up with the aspect of lack of scientific publication of Science Shop experiences. Science Shops are sometimes insufficiently aware that the reports

have only the status of grey literature within academia. They are not considered as scientific output that can be submitted to scientific journals. Within the scientific production process of scholarly publications, the reports therefore tend to disappear. In the case of Science Shop projects, this scientific reflection is sometimes further developed within the scientific institution, but the reflexive communication might no longer be attributed to the Science Shop (Zaal & Leydesdorff, 1987 in Leydesdorff & Ward, 2003, page 60). The report further concludes that publications that arise from Science Shop projects are not recognisably attributed to them because the Science Shop functions both as an institution *and* as a mechanism for translation (Leydesdorff & Ward, 2003, page 58).

The German case study report show that universities are more interested in "big projects" with a high amount of third-party-volume and in contact with big companies or other relevant institutions than smaller NGO-related projects, and due to this, it is difficult to engage scientists in Science Shop related activities (Germany, page 78).

A barrier mentioned in the Vienna case study report was the difficulty to find a supervisor for the students when they are co-operating with civil society through the Science Shops. Another barrier is that students might drop out of the co-operation even though the projects have not been carried through to the end, which will have no consequences for the students (Vienna, page 117).

4.2.5 The role of Science Shops in university strategies

The interviews with decision-makers in the national case study reports show that Science Shops relate to ongoing strategic discussions about the role of universities in some countries.

In the United Kingdom Science Shops can be considered as relevant in relation to the so-called third mission activity in higher education, which is outreach. All managers from the universities interviewed in the United Kingdom case study report recognised that these issues were now on the agenda of government, and expressed a personal interest in developing them, and publicising staff expertise visibly to external bodies (UK, page 69). University managers increasingly accept that teaching and learning must be combined with community outreach in order to justify public funding. But at present the third mission is almost exclusively dominated by the contribution of universities to scientific knowledge production within a business / innovation orientation whereby the scientific advances of academia are exploited commercially. Nevertheless, within the third mission there are other, less obviously commercial, undertones of civic responsibility, of taking up responsibilities for urban regeneration

(UK, page 87-88). The United Kingdom government is talking about widening participation and encouraging active citizenship, but the trends are going in the opposite direction, e.g. decreasing student grants, which means students have to work, increasing student numbers in higher education, which makes it hard to find vocational placements. The case study report from the United Kingdom further show that collaborative research is not acknowledged or perceived as important by the universities. It seems as the Research Assessment Exercise and subject benchmarking tend to reinforce closer disciplinary focus and discourage vocational work with a more applied content (UK, page 70).

The Head of Department of Manufacturing Engineering and Management at DTU pointed out, that a tendency within the university is, that more and more knowledge is produced within the universities, but the understanding of the knowledge and for which purpose it is produced is lacking. Science Shops are one way to promote and connect knowledge production and knowledge application in a broader context (DK, page 117).

The investigation made within the INTERACTS research project, aiming at analysing how Science Shops projects were made public, states that two major structural dimensions for comparison among the cases are provided by national differences among Science Shop practices and the disciplinary affiliations of the researchers. Perhaps, with the exception of Spain where the Science Shop is not yet itself a concept used for the mediation, the common origin of the discourse about Science Shops in the various European countries is recognizable. These activities seem to attract highly motivated, culturally advanced, and socially engaged students and young scholars who are seeking to make careers that are intellectually and socially meaningful. The Science Shops provide and generate social capital in terms of relevant networks first of all for the researchers involved. These projects can perhaps be considered as a distributed format of the new social contract between the universities involved and their environments (Leydesdorff & Ward, 2003, page 62).

4.2.6 What can be improved and how

The national case study reports have shown how Science Shops and Science Shop projects at universities need to be more attractive to researchers and to the university management. Efforts to identify and make publication possibilities visible in Science Shop projects are needed. By integrating a long-term research perspective into the Science Shop projects, researchers may also find the Science Shop projects more interesting.

The United Kingdom experiences show that the researchers feel a need for tangible

rewards for research associated with outreach activities in order to legitimate their involvement in theses activities (UK, page 68). Outreach obligations could also be part of the researchers' remit.

One aspect seen in the Romanian case study report, and which maybe primarily is related to the Science Shops within the field of natural science, is the need of some scientists to learn to consider that a technical solution can not be found without considering seriously the social dimensions to which the technical solution are related (Romania, page 76).

The national case study reports also show that in some countries there is a need for rethinking for having students involved in Science Shop projects or doing outreach activities. In Romania students are not allocated credit points at all universities when they co-operate with Science Shops or civil society. The universities in Romania are in the process of structural changes of the curricula, and allocation of credit point to students when co-operating with Science Shops are one of the points which needs to be considered further (Romania, page 85). The case study report from Vienna also points towards a need for universities to acknowledge the students work through the Science Shops. Students could be remunerated for their work, or at least reimbursed for their expenses in relation to the work they do through the Science Shop. One solution could be that Science Shops have a budget to reimburse the expenses of the students (Vienna, page 117).

4.3 The Mediation Perspective

This paragraph discusses issues related to the role of Science Shops as they have been through the national case study reports.

4.3.1 Two models of Science Shops

Two different models of Science Shops are represented in the national case study reports, university-based Science Shops and independent Science Shops (which here should be understood as non-university-based Science Shops). In total 12 cases were conducted in co-operation with university-based Science Shops and 9 cases were conducted in co-operation with independent Science Shops. The national case study reports show different Science Shop models also within these two models. The following paragraphs give an overview of the different Science Shop models involved in the INTERACTS national case study reports.

4.3.1.1 University-based Science Shops

Austria:

Two cases were conducted through university-based Science Shops, e.g. *Wissenschaftsagentur Salzburg* and *Patenschaftsmodell Innsbruck (PINN).* The *Science Shop Wissenschaftsagentur Salzburg* is a university-based Science Shop in the City of Salzburg. It is organised as a Non-Profit Organisation and focuses on knowledge transfer between the University of Salzburg and the society at large. *PINN* is a service centre for enterprises and organisations, a Science Shop equivalent, at the Faculty of Social and Economic Sciences, University of Innsbruck. *PINN* is aiming at building up contacts between university and Practice on a systematic and regular basis. *PINN* further aims at promoting the practice orientation in the economic scientific education. Students can choose between certain “Modules” or acquire the “PINN – Certificate”. Thereby they get in touch with their future professional environment (FBI, page 16).

Denmark:

Both Science Shops represented through the Danish case studies are university-based, but organised in different ways within the respective universities. The Science Shop at the *Technical University of Denmark (DTU)* (founded in 1985) is affiliated to a department, but is serving the whole university. The *Science Shop at Roskilde University Centre (RUC)* (founded in 1988) is placed under the central administration of the university. The aims of both Science Shops are to provide free access to science and research to civil society organisations by creating contacts between university and civil society organisations, and to provide students possibilities for qualifying through co-operation with these groups on ‘real-life’ topics as part of their curricula. The *Science Shop at DTU* further aims at contributing to the renewal of the education and research at the university (DK, page 9-10).

Germany:

Two cases are represented by the *Science Shop Kubus*, which is based at the Technical University of Berlin. Kubus was founded in 1986 and is part of the service institution for environmental and social questions at the Technical University of Berlin. This Science Shop is not affiliated to a specific Faculty. Kubus functions as a link between the university and different partners of the society. The target groups are mainly NGOs, public institutions, different departments of the city and district administration and small businesses (SME and the respective associations). Kubus deals with co-operation projects, conferences and workshops related to all kinds of social-ecological questions (Germany, page 7).

Romania:

Both Science Shops represented in the case studies from Romania are part of the university structures, though related to different departments within the respective universities. The *InterMEDIU Science Shop* was founded in April 1999 as a non-profit, independent department (Science Shop) at the Technical University of Iasi, rooted in the Faculty of Industrial Chemistry. The *InterMEDIU Science Shop* co-operates with Faculty departments and organizations of the civil society, as well as with other similar organizations on a national or international scale. Its activities are related to information, consultancy, and research in the field of environmental protection, as well as education and training. The *Science Shop InterMEDIU* provides an interface between university and society. The main objectives are related to the transfer of knowledge in the field of environmental protection from the university towards civil society structures, the facilitation of public access to environmental issues, organisation of programmes of environmental education in schools, high-schools or universities, as well as for other community groups, in order to increase environmental awareness and contribute to capacity building of environmental groups. It offers students, in co-operation with other members of academic staff, the possibility to gain experience with project work and co-operation with citizen groups and thereby to develop a practically oriented approach to environmental problems. (Romania, page 14-18).

The *Biology Science Shop InterMediu* at *"Al.I. Cuza"* University Iasi was established in March 1999. The idea behind this Information and Research Centre for the Civil Society was first to put the biological scientific knowledge at free disposal for the non-profit organisations and groups that lacked material means for scientific research. A second aim is to establish a tighter connection between academic education and research on one hand, and societal needs on the other hand. The focus is on the protection of threatened populations or species, and their habitat. Research topics are water, air and soil pollution; drinking water supply; waste management; population health aspects; energy efficiency; landscape; biodiversity.

Efforts have been made to integrate Science Shop's activity within the academic curriculum. Students are offered the possibility to undertake an optional course: "Ecological monitoring". The practical work consists of short term (2 weeks x 40 hours) or medium (8 weeks x 40 hours) research projects within concrete topics of Ecology and Environmental protection as a response to the civil society requirements (NGOs, Associations of lodgers or owners, client groups etc.) (Romania, pages 14-18).

Spain:

Arquitectura y Compromiso Social (A.C.S.) represented in one of the Spanish cases was founded in 1994 as a university association affiliated to two Architectural schools in Seville. The association *A.C.S.* consists of students, professors, architects, and other interested people. The association's main concerns are social instruction in the universities, construction of sustainable habitat in inner cities and global equality (Spain, pages 14-15).

United Kingdom:

The *Student Link* represented in one the United Kingdom cases is part of the structures of the University of Wolverhampton. Through the *Student Link* final year undergraduate students are enabled to conduct applied research projects for one semester (15 credits) or two semesters (30 credits). Most of the 'Student Linkers' are from sociology (around 15 – 20 a year), although other students are involved as well. The objectives of *Student Link* are among others to provide organisations with a forum to gain access to additional skills which will support them in their work, to give students the opportunity to develop research, vocational and personal and transferable skills in a practical and useful way, and to enable students to evaluate their own learning and skills development in the context of an organisational based project (UK, page 17-19).

Interchange represented in two cases from the United Kingdom was established in 1994 as a registered charity. It is a merger between two organisations, Merseyside Community Research Exchange (initially founded 1991 through the Enterprise in Higher Education initiative of the United Kingdom Department for Education and Employment) and the Liverpool Science Shop (established with a grant from the Nuffield Foundation). *Interchange* offers the opportunity for undergraduate students at Liverpool University and Liverpool Hope in the Sociology Departments to perform applied research projects for an NGO. The projects are equivalent to a dissertation (30 credits) and is undertaken in the final (3rd year) of their (Bachelor's) degree. The project is an option rather than a required module, and students need to demonstrate a sufficient level of attainment in their second year sociological research modules to be accepted on the programme. Since 1997, students from the MSc in Applied Social Research (taught jointly by Liverpool Hope and Liverpool University) have also been able to undertake a research-based dissertation through *Interchange* (UK, pages 17-19).

4.3.1.2 Independent Science Shops

Austria:
Four cases from Austria were carried out though co-operation with independent Science Shops. These are the *Science Shop Vienna*, the *Science Shop Graz*, and the *Institute FBI*. The *Science Shop Vienna* was established as a Science Shop specialising in offering free intermediating research services between NGOs and Viennese universities on one hand and as an independent research institute dedicated to concerns of NGOs and citizens on the other. Since the termination of the Austrian government's support for the intermediating services, the *Science Shop Vienna* focuses on independent research projects on issues brought up by NGOs and citizens.

The *Science Shop Graz* was established as a Science Shop specialising in offering free intermediating research services between NGOs and Graz universities on one hand and as an independent research institute dedicated to concerns of NGOs and citizens on the other. The intermediating research services are financed by the Karl Franzens-Universität Graz. Additionally, the *Science Shop Graz* carries out independent research projects on issues brought up by NGOs and citizens (Vienna, pages 17-18).

The *Institute FBI* is a Science Shop and an independent research institution operational since 1991. One major goal of *Institute FBI* is to bridge the gap between the university and the public in the sense of making advanced knowledge accessible, understandable, and applicable for a broad public. It serves as a link between academia and society, and between theory and practice on issues related to research, society and culture with a focus on women and gender issues (FBI, page 16).

Germany:
One case from Germany was conducted in co-operation with *Wissenschaftsladen Bonn (WiLa Bonn)*, an independent Science Shop founded in May 1984 and focussing on ecology and environmental protection. It is a non-profit and self-administrated institution with the objective to make science/ scientific results accessible for groups, institutions and individuals ('knowledge transfer close to the citizen'). *WiLA Bonn* has contacts with scientific experts of different institutions all over Germany. The services cover counselling and project-development, workshops and conferences, reports, surveys, and newsletters (Germany, page 7).

Spain:
Two cases from Spain were made in co-operation with independent Science Shops, e.g. *Pax Mediterranea SL (PaxMed)* and *ISTAS*. *PaxMed* was founded in 1995 and

has an office in Seville. It works in research within the social arena of ecology, economical development and social cohesion strategy from environmentally and socially sustainable perspectives. It is involved in various European and local research and monitoring projects and observatories.

ISTAS is a self-funded technical foundation promoted by the Spanish Trade Unions Confederation (CC.OO.) to support social activities for the improvement of working conditions and environmental protection in Spain. It has been founded to back trade unions' action in the field of occupational health and environmental protection. Being a Trade Union foundation, the orientation, programming and management of ISTAS are under supervision of a Directorate. The majority of its members are trade unionists appointed by the Central Trade Unions Executive Commission. *ISTAS* was created to serve all workers and maintains cooperation with similar organizations at European and international levels. It is autonomous in character and economically independent. Part of *ISTAS*' work for CC.OO. is to observe environmental, scientific and social science issues, which can have a detrimental effect on worker's lives. In this sense *ISTAS* acts as an independent observatory for CC.OO (Spain, pages 14-15).

4.3.2 Free or affordable research through the Science Shops

Some of the Science Shops offer free services to the NGOs, while other Science Shops show different models for coverage of the costs involved in the projects. The mediation costs are either covered by the university or through grants from projects and foundations. The research costs are covered by mobilising the resources of students and supervisors, who carry out the research as part of the studies and supervision tasks, respectively. Some of the university-based Science Shops charge the NGOs for costs related to travel and printing, and some for the research if Science Shop researchers carry out the research. The independent Science Shops charge the NGOs or offer free services by getting public funding for the projects or by co-operating with university students within the frames of an internship or a thesis.

Austria:
In the three cases made through the Science Shop Vienna there were no costs were involved. In one case from the Science Shop students were remunerated for writing an article based on the project for a brochure (Vienna, page 20, 49, 78).

In all the three cases presented by the FBI costs were involved in the co-operation. In the case from PINN the two undergraduate students, who conducted the research, were paid 1.090 Euro in salary. These costs were covered by the NGO. PINN, who normally gets paid for the mediation job they are doing, worked on a voluntarily basis

in this project. In the case from Wissenschaftsagentur Salzburg, the NGO covered a cost of 6.500 Euro. The student conducting the research got 650 Euro, the Wissenschaftsagentur Salzburg got 72 Euro for intermediation and co-ordination, and the rest covered costs for layout and printing. The case conducted by the staff from FBI involved costs of 3.270 Euro, which were paid by the NGO, and based on market interest prices for projects (FBI, pages 29, 46, 65).

Denmark:
In Denmark the Science Shops are built upon a model which does not request the clients to pay for having research done through the Science Shops. The Science Shop staff is financed by the universities, and the resources of students and supervisors are mobilised as part of the ordinary university teaching. In all three case studies no costs were involved for the NGO. One exception was a day care centre which voluntarily offered to pay for a study trip to Sweden, but the department would have been willing to pay the trip otherwise (DK, pages 17, 38, 48, 66).

Germany:
All three cases from Germany involved no costs for the NGOs. In the 'Tiergarten-Tunnel' project done in co-operation with the Science Shop Kubus, the NGO got 12.500 Euro for the research, financed by a Berlin based foundation. The costs for mediation staff and infrastructure were financed by the Technical University Berlin. The 'Creative Committee' initiated by Kubus involved costs of 3.000 Euro, which were also funded by the above mentioned foundation. In both cases Kubus obtained the respective costs. The costs covered salary for workshop moderation and documentation of the project. The project 'Stiftungsründung' initiated by the Science Shop Bonn had a budget of 210.000 Euro, which mainly was financed by the Federal Environmental Agency in co-operation with the Federal Environmental Ministry. The Science Shop Bonn got 10 % of the budget (Germany, page 16, 28, 56).

Romania:
The two Romanian Science Shops represented in the case studies are based on the same model as the Danish Science Shops, i.e. providing free research to civil society. Costs were involved in the three cases, but they were all covered through the MATRA program (a Dutch program supporting the establishment of Romanian Science Shops). In the case regarding Biodiversity conservation in the Wetland British Petroleum Environmental program funded some of the costs (Romania, page 25, 41, 53).

United Kingdom:
In the three case studies from United Kingdom costs covering the students travel

expenses, and photocopying were paid by the NGOs requesting assistance through the Science Shop assimilations (UK, page 27, 39, 52).

Spain:
The cases from Spain involved costs covered by the clients. The PaxMed project involved costs financed by both the NGO (900 Euro), the Science Shop itself (600 Euro) and the university (840 Euro). The scientists and the Science Shop staff worked voluntarily on the project. In the project done through A.C.S costs were covered by the NGO and the Science Shop. In the project done through ISTAS there were costs involved for a full time technician for nearly a year (Spain, page 27, 38, 53).

4.3.3 Science Shops as mediator between civil society and university

The national case study reports show that Science Shops provide several types of functions as part of the interaction between NGOs and research. Some functions are mostly related to mediation between NGOs and researchers or students at a university and other functions are more directly part of the knowledge production process:

- Providing easy access to the resources of universities
- Mediation between the knowledge need of the NGO and the researchers and/or students as part of the project planning
- Carrying out research
- Acting as knowledge repository ensuring continuity and progress from project to project
- Acting as antenna for new societal topics, which are not yet addressed by NGOs or authorities
- Acting as incubator for new research and teaching areas.

The knowledge production itself takes place in a number of different ways with respect to NGO participation:

- Knowledge transfer to NGOs, where existing knowledge is transferred to the NGO by the Science Shop
- Knowledge supply, where researchers or students produce new knowledge, which is transferred to the NGO
- Participatory knowledge production, where the knowledge production take place in co-operation between students or researchers and the NGO. Depending on the Science Shop model the Science Shops can be mediating and guiding the interactions or participate in the research themselves.

The approach of knowledge production is shaped by the conditions of the involved actors and their understanding of research. The participatory approach applied in most

of the projects implies that the knowledge of lay people is considered as important as academic or scientific knowledge.

4.3.4 Science Shops as access to research resources

The existence of Science Shops or their equivalents mean that there is an organisational structure in place for linking across university and community. By providing the link between civil society and university, the Science Shops remove barriers for smaller NGOs to approach the universities. Barriers mentioned in the case studies were that the NGOs do not know how to approach the universities, the NGOs do not have any funding for research, and they are reluctant to apply research methods to their own projects because of lack of confidence (UK, page 76; FBI, page 7). In the Danish case study report it was explicitly mentioned that without the Science Shops and the free access to research, they would never have had the opportunity to have the research done, due to lack of resources in their organisations (DK, page 109).

Some cases in the case study reports further show that Science Shop projects might arise from long-term relationships with NGOs or single key persons in the social or environmental field. This points to the importance of networking between Science Shops and NGOs (FBI, pages 86-87).

Ensuring that appropriate students are involved in Science Shops projects is one of the tasks which the Science Shops perform. One of the NGOs represented in the United Kingdom case study report expressed that Interchange had performed a useful role in ensuring that appropriate students had been involved and sensitised to the needs of the NGO, through preparing them for the specific issues concerning the research placement (UK, page 73).

4.3.5 Science Shops as mediating institution

An initial process of negotiation can always be distinguished in Science Shop projects. In this phase each party learns about the requirements of the others, and the research questions can be operationalised in a student research project given the limits of student capability and academic requirements (UK, page 84; Kubus, page 34). By linking between university and community Science Shops mediate between those, who have a concrete practical interest and those who might emphasize the theoretical aspects of research (Vienna, page 84).
Translating questions from a civil society organisation into a research perspective is one of the major jobs a Science Shop contribute to perform, before a project co-

operation can start. The case study reports point towards this task as being complex and time consuming (UK, page 76, 86; FBI, page 86; Vienna, page 86). The experiences from the case study reports are that some larger NGOs more often have formulated research questions before they address a Science Shop, though they may not have the resources to undertake research themselves or to commission funded research. Smaller NGOs are in some cases less able to formulate research questions, and may be hesitant about approaching universities or lacking knowledge about who to approach and how (UK, page 86).
The Austrian case study reports characterise Science Shops as a background trouble shooter and mentoring platform, signalling to everybody from the beginning to have an open ear and that everybody can rely on the support of the Science Shop if problems or conflicts would come up (Vienna, page 87; FBI, page 35).

The strength of Science Shops is that they mediate between theory and practice. The Science Shop Kubus has made a step towards transdisciplinary work by assembling transdisciplinary teams (Germany, page 79). This can be seen as a way of mirroring the complexity of real-life topics in the way the research team is composed.

4.3.6 Science Shops as repository of knowledge

The cases from the United Kingdom case study report further point out that Science Shops can be seen as repository of knowledge. The experiences from Science Shop projects are often used as background information/ knowledge when new projects are planned and carried out (UK, page 75).

As part of the Science Shops mediation between civil society and university Science Shops also help promoting the work of civil society (Vienna, page 87). Science Shops can have an antenna function, as it was seen most clearly in one of the cases from the Spanish case study report, where the Science Shop equivalent acted as a watchdog for environmental and health issues towards workers and neighbourhoods (Spain, page 69). Another example of the impact of Science Shops as mediators between society and university is shown in one of the cases in the Danish case study report, where several requests from NGOs within the area of organic food to the Science Shop at DTU, lead to the establishment of organic food as a research and teaching area at the university (DK, page 64).

4.3.7 Problems, Barriers, Dilemmas:

The national case study reports show that one barrier that many Science Shops face is lack of visibility, both towards the public and towards researchers, students, and decision-makers at universities and in research planning.

The Vienna case study report point out that the contribution of a Science Shop to a successful project is not visible enough (e.g. the mediation is not visible). However, too much publicity could trigger a demand which smaller Science Shops would not have the resources to cope with. A future task for the Science Shops will be to solve this dilemma of making the Science Shops work more visible (Vienna, page 97).
Too low visibility in the general public and among NGO's is also a barrier identified in the case study reports. This seems to be an important aspect limiting the societal impact of Science Shops by limiting how many NGOs that are approaching the Science Shops (DK, page 118; Spain, page 20).

The Romanian case study report show that Science Shops here are small entities known at a local or regional level, but with limited access to national policy and media levels. This situation might change in the future by the creation of four new Science Shops at different universities and in different regions, and by the creation of a national Science Shop network (Romania, page 73). The regional coverage and visibility of Science Shops has to be improved and the support of university management structures and policy makers is essential in order to achieve the needed outreach towards society organisations and the network of universities (Romania, page 3).

The Danish case study report show a barrier related to the Science Shops position at the universities. The Science Shops are perceived by some students as a separate institution at the university and not as an integrated part of the university. This made the students think that the Science Shop was not fully accepted at the university and doing a project through the intermediary might be less scientifically than doing a project directly for a researcher at one of the institutes at the university (DK, page 115).

The Spanish case study report argues that Science Shops are invisible due to the fact that the Science Shop concept is completely unknown in Spain. They further point out that in Spain things often work by word of mouth between a small network of people who know each other and move in similar circles and projects (Spain, page 34). Also the United Kingdom case study report discuss the aspect of the Science Shops being relatively unknown at the universities in the United Kingdom, though there is a considerable undercurrent of such activity, without the formal designation of a Science

Shop, where individual departments and members of staff have a philosophy incorporating outreach to the community. There are indications that universities in United Kingdom are increasingly thinking about outreach as an aspect of their mission, though this starts from a low base, and is held in check by the many other priorities being placed on staff for their core activities of teaching and research (UK, page 85).

Another barrier mentioned in the Danish case study report is the aspect of uncertainty whether and when students might respond to the NGOs request (DK, page 110).

4.3.8 What is needed, what has to be improved

The case study reports show that securing sufficient and long term funding for development and staffing in Science Shops is essential (Romania, page 73; UK, page 70). The Romanian case study report argue that to fund Science Shop activities only from projects is time consuming and not always successful in terms of results (number of proposals vs. granted projects). A specific policy at the national level (Ministry of Education) or supra-national level (EU, international organisations) would encourage more universities to start and support Science Shop activities (Romania, page 89).

In the United Kingdom the tendency is that much of the funding for development of higher education has been channelled to teaching and learning units within the universities, rather than to the academic departments or staff and that on the whole there is little application of this funding to curriculum based learning in the community (UK, page 70). If the role of Science Shops is also to include the role as incubator for new scientific fields within the universities it will require more funding in terms of employment of scientific staff (DK, page 119).

The Science Shops need to improve and develop their marketing and publicity functions (UK, page 85; Germany, page 81; DK, page 112). The German case study report point out that it is important for Science Shops to have a marketing strategy. This can provide a professional reputation and a clear profile to the organisation. The marketing strategy should include the personal and professional networks that are used to spread information of Science Shops and their services, which have proven to be a very efficient marketing instrument (Germany, page 81). A university policy-maker in the Danish case study report pointed out that one way of marketing the Science Shops towards students and university teachers could be by putting emphasis on the different projects the students have to perform during their studies, and which requirements each project contains and how this can be obtained through Science Shop projects (DK, page 112).

The case study reports also show that there is a need to increase the visibility of Science Shop activities within the scientific circles. This means there is a need to increase efforts for university staff and students to publish in scientific journals based on Science Shop projects (FBI, page 89; DK, page 118; UK, page 86). In the Danish case study report it is argued that Science Shops have to involve the university departments more in the translation of the requests into projects in order to increase the scientific interest from researchers in Science Shops projects (DK, page 113). The relation to the university researchers could also be strengthened by more direct interaction with the researchers, like setting up thematic networks or counselling committees consisting of both representatives from university institutes and civil society organisations (DK, page 113).

The case study reports point towards a need for formal networking between independent Science Shops and universities (Spain, page 36; FBI, page 8). The Spanish case study report shows that setting up formal structures between independent Science Shops and universities could prevent knowledge from getting lost or knowledge not being communicated to interest groups. It will further ease the transparency of knowledge production (Spain, page 36).

The regional and national covering with Science Shops should be improved in several of the countries. The establishment and fostering of networks is more promising on a regional level, and a lot of funds are regional (Germany, page 81). Promoting Science Shops at a national level implies more networking among Science Shops, NGO's and researchers (Romania, page 3; DK, page 111).

The Danish case study report also show that there is a need for engaging more students in Science Shop activities, and make them aware of the possibilities co-operation with civil society can give them, e.g. technical and social skills, career possibilities, practical experiences etc. Higher visibility both towards society and towards university could be one way to engage more students in Science Shop activities. Other ways to strengthen the relation to students' could be to involve students' organisations and have students who have finished a Science Shop project to tell about their research and the impact to the clients to other students (DK, page 113, 118).

The report investigating how the cases in the national case study reports were made public, highlights that the Science Shops should be encouraged to make reports available (as some of them are) as files on the Internet. It provides researchers, students, and clients with points of reference in their practices, and publication on the

Internet can be expected to provide more access and recognition from various sides (Lawrence, 2001 in Leydesdorff & Ward, 2003, page 61). The availability of reports and the active updating provides opportunities to claim the credit for an innovation at a later stage, even if the effects of the new insights are somewhat disappointing in the short term. For example, if in a later stage (e.g., after the next elections) a municipality should decide to clean the pools in their village, the role of the Science Shop project would become partly attributable as credit to the students who took the initiative. It would be impossible to ignore this link if the reports were properly archived (Leydesdorff & Ward, 2003, page 61).

A number of "best practices" can also be defined as: 'best student paper', 'best report', 'best advice', etc. The jury could be staffed by a board-like committee where clients, administrators, and scholars (university staff and/or externally) meet to discuss the results of the past year with the purpose both to provide recognition for the students and scholars involved and to make recommendations for improvements in the quality of the mediation (Leydesdorff & Ward, 2003, page 61).

Some of the case study reports also pointed out concrete activities, which the Science Shops could initiate in order to promote and develop their work and become more visible both towards society and university. The proposals are:

- Organise seminars, lecture and campaigns (Germany, page 46)
- More systematic research done through the Science Shops (Germany, page 46)
- More methodology included in Science Shop projects (Germany, page 46)
- Creation of a student and a interest database (DK, page 111)

4.4 Round Off

The case studies show that despite the variation in terms of nations, disciplines, institutional settings, etc., the Science Shops have developed a common language of mediation between citizen groups and the public sphere. This common language has evolved in local niches as best practices of mediation. The communication of Science Shop mediation adds another layer to the practical mediation itself. The comparison among the case studies allowed to distinguish the institutional integration between the higher-education function and the research function of the university. This distinction is perhaps more important than the focus on national differences (Leydesdorff & Ward, 2003, pages 64-65).

The tasks of the Science Shops in recombining normative concerns with analytical perspectives could further be explored and the inherent tensions in this type of work made visible. It seems obvious that wherever these mechanisms are successful in solving the puzzles involved, they can be expected to remain fragile. The Science Shops operate at interfaces which are not continuously needed from the perspective of the institutions. However, these interfaces may be crucial for the development of a knowledge-based society from a system's perspective. The translation of clients' concerns and demands into the research and education system and the feedback of supply by research and higher-education legitimate the latter and this mediation deeply involves public audiences because their substantive demands are taken seriously. Academic freedom can thus be appreciated more fully as a societal resource (Leydesdorff & Ward, 2003, page 65).

If the university would like to profit from societal input both at the level of higher education and at the level of research, communalities in the interfaces of research and higher education with the university environment should be further developed. This could fore instance by done by the establishment of rewards for best practices, structures may have to distinguish between social relevance and scientific quality, and establishment of a standing committee at the level of the board that investigates the potentials for further development at the interface with the surrounding society more systematically and in terms of both research and higher education.

5 Comparison of the Scenario Workshops results

This chapter is comparing the results of the 7 national scenario workshops conducted by all partners within the INTERACTS project. The comparison is based on the national summaries provided by all partners. The national summaries follow a commonly adapted scheme and are part of the final report. The national summaries provide an overview of the national INTERACTS project activities and experiences and summarise the most important national results. With regard to the scenario workshops the national summaries contain information on the following aspects:

1. *Basic reference data* (country, location of the scenario workshop; title of the workshop; date and duration; organiser/ moderators; information material)
2. *Participants (listed)*
3. *Presentations by the organisers*
4. *Workshop results* (visions (the different interest groups (role groups) best case scenarios), Scenario non-governmental organisation (NGO) and in the case of Germany trade union, Scenario intermediary and transfer groups, scenario politics and administration, scenario science and research and in the case of Denmark scenario students; common Priorities (thematic groups); proposals for future action
5. *Implementation/dissemination* – suggestions for concrete steps

In cases where the information provided by the partners on a certain topic was not sufficient the authors of this chapter did draw back on the detailed national scenario workshop report.

This chapter is divided in two sub-chapters.
The first chapter explains the methodological adaptation of the basic methodological approach chosen to develop a new tool to conduct participatory workshops – to conduct “Scenario Workshops”. It also gives some insight in the rational behind the individual adaptations.

The second chapter is aiming at providing an overview on the seven scenario workshops as well as working out common tendencies by comparing the scenario workshops based on the information provided in the national summaries and furthermore working out unique features of the individual national scenario workshops. This chapter is not aiming at covering every detail of the individual national scenario workshops. The deviations from the majority and the unusual features are only included and discussed selective and exemplary. Of cause the selection process was aimed at obtaining objectivity but every selection also re-mirrors the personal view of

the authors, which may not necessarily correspond in all aspects with all project partners. It is recommended for the interested reader to refer to the individual national "Scenario Workshop Reports" to deepen their understanding.

5.1 Modifications of the Basic Method (the European Awareness Scenario Workshop - EASW) and their Rationale in Detail

5.1.1 Time frame

In order to provide enough time to develop the scenarios and to plan the activities an European Awareness Scenario Workshop (EASW) is scheduled to last two days.

To conduct a Scenario Workshop - a tailor made adaptation based on the EASW - the partners of the INTERACTS project decided to shorten the time frame to one day by combining and shortening intermediary stages.

The rationale for this decision lay in the realistic assumption that for politicians and university professors a workshop organised by a non-official institution like the Science Shops would not warrant abandoning their day-to-day activities for two whole days. So, in order to prevent getting only second and third ranking representatives to attend, it was decided to contract the time frame.

The second reason for shortening the time was the broadness of the topic. It was clear from the start that even two days would not be enough to discuss the topic exhaustively, rather, the workshop would serve to discover ideas, compare them and, at the most, agree on first steps to be taken in consultation with each other. The hope was to put into motion a process of dialogue and networking which has to be continued longer term on a regional level.

5.1.2 Development of Scenarios

Within an EASW the role groups develop a best case and a worst-case scenario. For practical reasons, time constraints and also with respect to the general aim of the workshop to investigate on the improvement of the relationship between research (university) and society most partners decided to focus only on the best-case scenario. Nevertheless in the case of Denmark and Romania the role groups also developed and worked with a worst-case scenario related to the workshop focus question.

5.1.3 The role / interest groups

With respect to the key stakeholders in the INTERACTS project it was decided to have the following four role groups: Non-governmental organisations (NGOs) and trade union; politicians and administration, universities/researchers and intermediaries /transfer groups.

Denmark decided to have five role groups by dividing the university/research group into "students" and "researchers and educators". Because it was believed that students and researchers do not have the same perception of what is needed to improve the relationship between university and society. And this also turned out to be true, the students focused on other aspects than the researchers did.

5.1.4 Provision of Scenarios and Chairing of Working Groups

In the classic version of an EASW, the participating groups are being confronted with given scenarios, in the case of urban planning on a scale of more or less technological development and more or less personal initiative.

The given topic could, of course, also be modified. Most INTERACTS partners, however, did without pre-given scenarios and chairing of working groups. This is due to the perceived high expertise of the invited participants and the small numbers. It was considered too unwieldy and also patronising to chair a working group of city councillors, university professors, high-ranking civil servants etc. The people invited knew best what they wanted to discuss and wanted to do that in an unrestricted manner. There would have been little point for the organisers to construct future scenarios, only to have them rejected and start the working process on a negative note. We wanted to find out about new ideas, new visions and not hamper them with too tight a framework. The project workers of the Science Shops, for whom INTERACTS is their second project on science transfer via intermediaries, think they know from experience and from their research work with this model in its various forms and development, how the dialogue between science and society via intermediaries can work, but they do not want this knowledge to dominate to such an extent, that other innovative possibilities are not being considered any more. We as workers of the Science Shops are keen to discover ideas hitherto not considered in our work and the best way to do this is not to channel the participants thinking into given scenarios.

5.2 A Comparison of the Results

5.2.1 The Focus of the Workshop and the Organisation of the Workshop

The title of each workshop expressed the focus of the respective organisers. Most titles expressed a wish for dialogue on:

- How to improve and develop it (the dialogue),
- Future collaboration and its preconditions, among three groups, namely academia, society (represented by NGOs) and intermediaries
- Sustainable Development as dialogue between science and society

Denmark, the UK and Romania decided to focus on the intermediary and put: "How can Science Shops contribute to the development of the co-operation between citizens and universities" (Dan), "How can the relationship between university and community be strengthened by Science Shop activity" (UK) and “How can the relations between the civil society and university be strengthened by Science Shop activities in 2010” (Rom).

The central image for the workshops is the triangle formed by academia/science, society (civil society, non-profit organisations) and transfer institutions like Science Shops and the mutually beneficial interaction between the three areas.

All workshops followed a similar time frame, starting between 8:45 and 9:45 a.m. and ending between 4:30 and 6:15 p.m.. With the exception of one, all workshops were held at a location within the university. The one exception was held in a subsidiary of the regional Chamber of Labour, which is physically housed in a university building. This subsidiary is dedicated to researching into the future of work, which made it thematically relevant to the workshops. The venues were chosen for their low cost and by thematic relevance.

5.2.2 Number of Participants

Participant numbers ranged between 14 and 25. A well balanced participation of representatives of all role groups was intended. Nevertheless in some cases it proved to be difficult to have a sufficient number of politicians and representatives of NGOs participating in the role groups. Some partner organisations sent a representative to the Intermediaries group. Where they did not, it was probably due to staff shortage or to avoid a biased view.

Participants with the most regional importance were recruited by the Science Shops which are better staffed and integrated into the relevant university than other groups.

Here again the basic difference between Science Shops within the organisational framework of the university and autonomous institutions could be observed. This difference in status impairs the direct comparability of the results.

5.2.3 Information Material

Initially, various comprehensive folders and invitations were being prepared. The Spanish partner made available a sample folder. Analysing the actual participation, it became clear that direct contact by telephone, e-mail or in person achieved the best results with the most important and representative participants.

All partners provided information about the INTERACTS project, about their own institution and about the scenario workshop methodology alongside the invitation.

Other optional materials distributed: inspirational material in Denmark, a Science and Society Action Plan of the EU in Spain, a feedback form in the UK, a summary of the Case Study Report in Germany and the Romanian Case Studies Report (the full report was sent to those participants who acted as interviewees for the case studies or on request to 3 other participants) in Romania and Denmark.

In the introduction to the workshop in Denmark, various topics at the edge of the workshop itself were dealt with comprehensively. Papers were given on types of knowledge requirements in different societal groups, on trends within Danish university politics, on the motivation of students for projects in collaboration with NGOs. In Germany, the topics of the case studies and results (on what intermediaries could learn from the case studies) were referred to. In Romania a presentation was given on the university-society interactions through Science Shops in the European and Romanian context. This was followed by examples of types of requests and projects that can be realised through Science Shops and how these can contribute to an improved access of the society groups to scientific knowledge and at the same time have an impact at the university level. In Spain in addition a SWOT analysis (The strengths, weaknesses, opportunities and threats the Science Shop development in Spain is confronted with) was presented.

All partners were in touch with the press before and after the workshop and provided press releases. At the Scenario Workshop in Innsbruck, a science correspondent took part in the workshop in the intermediaries group.
A comparison shows that the agreed parameters of the national scenario workshops were kept to on the whole and the formal set-up was pretty uniform.

5.2.4 Scenarios

5.2.5 Scenarios of the Intermediaries

What the scenarios have in common is the assertion that Science Shops recognise particularly societies need for research and that this is unique in the research environment both inside and outside of universities, at least at this level of consistency and thoroughness. This special quality is to be strengthened, as it ensures that societal requirements for knowledge is being passed on to those who can fulfil them. Without Science Shops and similar intermediaries, interested civil society is not represented in the system of knowledge production. Demands are made for a stake in decision-making processes: "Society and its participation is not presented in decisions in research" (Spain).

On the other hand, the contribution of social organisations to innovation and social progress remain under-appreciated both from society and universities (Denmark).

In the work of intermediaries, there is room for citizen-friendly methods like "problem-oriented action research, social learning processes, interdisciplinary and participatory research" (Germany); "the science shops will facilitate effective communication, in real time, between the civil society and universities" (Romania).

In order to continue fulfilling these functions and possible fulfil them better, the following things are deemed necessary:

- Sufficient finance and staffing levels and general appreciation. "A constant financial support of university-society co-operation will be provided through governmental funds and special fundraising activities" (Romania).
- Installation of a cooperative network with partner institutions in both directions of the transfer process as well as among intermediaries. "Haus des Wissens – “House of Knowledge" (Innsbruck) -
- "Cooperative network with an office in the university and an office in the city" (Spain).
- Science Shops should be authorised to issue certificates and references for students, the work done by members of the university in the area of citizen-orientated and participatory research should be recognised within the academic community. "Science Shop is an essential partner of the university" (Vienna).
- Emphasis should be put to give citizens a voice within an academic environment. This could be achieved by intermediaries acting as interpreters, as mentioned in the Case Studies, and by training citizens to help themselves (Spain, Innsbruck).

- "Awareness and educational programs realized through science shops will contribute to the stimulation and development of a dynamic involvement of civil society in the policy making process" (Romania).
- Science must be re-organised, taking under account local knowledge, and trans-disciplinary research is rewarded by the scientific community, as well as by financial sponsors (Germany):

In sum: Scenarios for the Intermediaries show them as well networked, established centres of knowledge transfer, interpreting for citizens and acting as a bridge between academics and praxis in a climate of mutual appreciation.

5.2.5.1 Scenarios of Researchers/University

"University goes public and is public" (Innsbruck) is one of the visions. The academics would like support for the installation of institutions like the Science Shops in order to fulfil important tasks like "knowledge sharing and research integration" (Denmark). These institutions should be "more visible and outreaching towards university and society" (Denmark). " Science Shops become an "information centre" concerning the requests formulated by the civil society and the local administration and also the scientific possibilities of the university to solve these requests, supported by an active and continuous communication between University and society as dialogue partners" (Romania). There is a lack of "incentives for scientists" (Spain) and no need to continue the tradition of universities dedicated to elites. This chimes with suggestions like the ones made in Innsbruck for leaving off academic titles or holding academic presentations in pubs. Mass media too can contribute (Spain) or "round tables" or "efficient and continuous dissemination of the solutions to all the requests" (Romania), all institutions equipped with mediators". (UK). "Interfaces between the different interpretations of reality through education and experiences (Vienna). “Science and society" is seen as "action in progress". (Spain) To support this, it is envisioned for universities to build up partnerships with for example local administration institutions and NGOs. The understanding society has of science/academia and the results it produces, needs to be developed further. "Training is the main element in the relation between science and society" (Spain); "guest lectures for everybody and by everybody on all topics" (Vienna).

In Vienna demands were made for research into knowledge and knowledge production in an "institute of Integrative Science with masters degree" (Vienna) with the aim of promoting the results and opening up access to knowledge.

The connection to society should be established by means of an increased number of round tables, mediators and translators, to guide the dialogue and to get influence on

researchers goals. All university faculties should be equipped with mediators to create these connections (Germany).

In sum: academics are aware of their importance for and responsibility towards society. To live up to this role and responsibility, the academics believe that the use of the media and established intermediaries are necessary.

5.2.5.2 Scenario of the Students

The project partners in Denmark decided to have students as a separate role/ interest group due to their assumption, that students might have a different perception compared to that of the researchers of what is needed to improve the relationship between university and society.

“The students’ scenarios contained a wish of Science Shops being more visible and outreaching towards both university and society. They further identified a need for developing the procedures for Science Shops projects, in order to strengthen the dialogue between the involved partners and to ensure knowledge sharing (Denmark).”

5.2.5.3 Scenarios of the Politicians and Administration

The politicians make several demands of science and research, as summarised in the Innsbruck workshop: "Science should improve quality of life and living conditions, strengthen democratic structures and invest in comprehensive education and lifelong learning" (Innsbruck). All groups put emphasis on democratisation and an assessment of the value of science for society. "Democratisation of knowledge should be a positive standard of the EU"; "science shops produce research as public property" (Vienna); "democratisation of the whole society" (Germany) down to a discussion about these values: "a legal analysis of the usefulness of research" (Innsbruck); "discussion of legitimacy of universities" (Denmark).

Here too, the responsibility of science vis-á-vis society is posited and demanded: "fostering research related to social needs" (Spain).

As an incentive for pursuing this kind of research, these groups too, are looking at links to the qualification of the researchers: "should be of value for the future career" (Innsbruck). A vision of an “open-university” emerges: "co-operation with civil society organisations can become legitimate to address within the concept of the Open University" (Denmark), intensified co-operation with stakeholders: "networking with stakeholders" (Vienna) and "thinking becomes inclusive", e.g. politics takes account of scientific potential and research with practical relevance becomes involved as a service

provider (Germany). As one element of the necessary background in the Romanian workshop was identified:" the university ability to enforce changes related to societal needs so as to influence more the governmental policy decisions and achievement of changes at the level of university management so as to create the open university profitably oriented to the citizens needs, knowledge and experiences. " (Romania). The necessary resources are touched upon as well.

In sum: politicians demand an opening up of the universities as production centres of knowledge and the possibility to make use of them for solving problems of the society as a whole, while enhancing democracy and legitimacy.

5.2.5.4 Scenarios of the NGOs / Community Groups and Trade Union

NGOs reiterate the need for problem-orientated research that takes an interest in everyday life and the implementation of the research in practice; " needs for more Science Shop research in basic societal topics" (Denmark).

The representatives of NGOs support networking and demand a stake in political as well as academic decision-making processes. In their view, institutions like Science Shops are necessary and/or useful for managing such processes: "science shops deal with research on trends of actual problems" (Vienna); "each university has a service centre responsible for the dialogue between science and society as well as a supervisory board. This board consists of representatives of NGOs, grass roots movements, trade unions, the economy etc. with the aim of initiating, supporting and monitoring the dialogue and auditing the implementation of community based research" (Innsbruck). "Easy access to University as a source of information, education and a problem solving system, based on Science Shop as intermediary stations" (Romania).

Networking should take place, both through institutions like Science Shops between society and academia/science and among the NGOs themselves: "international and national networking"; "Science Shops promote networking between NGOs" (Vienna).
Financial and ideological autonomy of intermediaries is essential for this task: "guaranteed financial autonomy of Science Shops and independence" (Vienna) as is their function for regions not immediately contiguous to a university: "Science Shops integrate the rural region, where there is no accumulation of researchers" (Vienna). Scientists could spend a third of their working hours with NGOs and learn to integrate the requirements of society permanently into their home institution within the university: "scientists as NGO co-workers on 1/3 of their working time" (Germany). Additionally, NGOs would like to be project organisers contracting intermediaries or researchers to

fulfil community based information demands. There is one sponsor fund for all NGOs (Germany).

In Spain the idea of access of civil society to the production of knowledge and its results emerges under a pirate flag: "civil society self-manages in knowledge and action" (Spain).

In sum: NGOs confirm a need for science in their practice and demand an institutionalised system like intermediaries or exchange arrangements for scientists or participation in planning and decision-making about research projects.

5.2.6 Themes distilled out of the Scenarios

In a moderated group discussion the following themes - distilled out of the Scenarios - were drawn up by the participants. These themes were the topics the thematic groups continued working on.

- The role of Science Shops (Denmark)
- The Open University (Denmark)
- Network and research integration (Denmark)
- Knowledge and project processes (Denmark)
- Institutional awareness (Spain)
- Training for citizenship (Spain)
- RDT Policy oriented to social problems resolution (Spain)
- Bigger participation of associations and institutions in the process of scientific and technological production to civil society request (Spain)
- Inclusive society (UK)
- Science Shops to be used as a trigger for social change (UK)
- Science Shops to strengthen the voluntary sector (UK)
- Science Shops to be responsive (flexible) to specific community contexts (UK)
- Universities and community to work together from primary school upward (“floating support”) (UK)
- Science Shops to be "two-way-streets" (Interchange model) (UK)
- Interface - House of Science (Innsbruck)
- Objectives - Relevance - Resources (of science) (Innsbruck)
- Participation (Innsbruck)
- Structure and organisation of research (Germany)
- Research goals - Reflections about society (Germany)
- Translation of Science into practice, action, participation (Germany)
- Co-operation - Knowledge transfer (Germany)

- Exchange of institutional staff (Germany)
- Support by Politics, Universities and the Public (Vienna)
- Finances and Subventions (Vienna)
- Networking (Vienna)
- A different kind of science and research (Vienna)
- Open, permanent and active communication between university and society (Romania)
- Intermediary structures (Romania)
- Specific communication supported by the representatives of all stakeholders, mass media and IT (Romania)
- Visibility of the partners and intermediaries (Romania)
- Financial and strategic support (Romania)

On comparing the topics discussed, certain themes emerge. Strongest among them is that of networking and participation; that is all processes which let organisations of civil society participate on a permanent basis in research and planning processes, facilitating the integration of the research results into the social environment and enhancing the role of interfaces like Science Shops.

The next important theme centres on the research topics themselves, the opening of universities to society, the questioning of the structures and organisation of knowledge production, the translation of research results into practice. This is related to the usefulness of science and how it can be tapped for the non-profit and social sector. There is demand for a different kind of research; a useful, transparent research which will benefit everyone in their everyday life. Science Shops should contribute to this as interfaces, as a trigger for social change and social progress.

In some of the topics the task and role of Science Shops is put explicitly as one of strengthening the welfare sector, empowering citizens to act on science and to make knowledge useful to them, with the Science Shops acting as conduits for two-way communication and co-operation.

Also mentioned were financing options, the support of politics, university and the general public for intermediary institutions, their integration into the politics of science, e.g. RDT policies, as well as the general awareness of the possibilities offered by intermediary institutions.

In sum: central are demands for research which is relevant to the everyday life of society and to that end the strengthening of interface institutions like the Science

Shops.

5.2.7 Suggestions for concrete next steps

Two follow-up meetings were carried out in Denmark and in Innsbruck. In the UK a national conference was scheduled to present the model of Interchange and to demonstrate the potential of Science Shops. In Innsbruck a working group was set-up in order to develop the concept of a "House of Knowledge".

Several workshop participants expressed a desire to discuss further the development of the dialogue between science and society. They were going to keep each other informed about their activities and hoped for linking up with other networks. Spain developed a sophisticated "Watchtower of social demands" with forums that are open to other interested people.

Networking was a core aspect in the discussion as well as in actual steps taken. This was about networking among the workshop participants plus expanding the network via additional partner organisations. In Denmark a network was set up consisting of the workshop participants. This network is to work continuously on how to improve dialogue between University and society. In Romania the creation of a network that would envisage participation of Science Shops, NGOs, university representatives and local administration was brought up. Forums or workshops on social questions to be set up, physical and virtual spaces to be opened up as meeting places for scientists/academics and social movements, and a campaign to disseminate scientific results.

Particular emphasis was put on the regional link-up of intermediaries, networking of the Science Shops in form of an association. Such a coming together should not be restricted to formal aspects but encourage closer co-operation and the exchange of information (Innsbruck). In Germany numerous module-workshops bringing together role group representatives and an extended audience, aiming at re-organising teaching-modules for students taking into account national EASW results and role group experiences. In the UK, the idea was put forward to establish a small network of influential persons/politicians locally to support their Science Shops.

New media could be exploited to strengthen the network and to reach a broader public: first steps have been taken to put together a new mailing list of participant organisations (Innsbruck). Suggestions were made to set up a file or a database that would make it easier to call up existing information and contact details as well as

publications of the Science Shops. (Authors note: this has already been developed and set up in the SCIPAS project.)
Cooperation with journalists is to be intensified and new avenues of publishing results to be explored, for instance in the form of comics for young people or TV documentaries (Spain).

Concrete proposals and declarations of intent to improve transfer processes were also made during the Scenario Workshops. A manual for an optimal project schedule should be drawn up (Authors note: this is described in SCIPAS, Report 2). Positive examples for projects should get more media attention and promotion. Emphasis is being put on taking research partners seriously and on their special importance as clients. Science Shop projects should also be evaluated more systematically than previously in the form of follow-up procedures examining their impact (Denmark).
Objectives for scientific projects are the participation of the objects of research in the project, a cross-disciplinary approach and having mixed groups of researchers as a rule. NGOs too should be informed about participation options.

In order to drive the suggested processes on, it was proposed to establish various bodies. Science Shops could install advisory boards, in which regional NGOs would be represented and could thus participate in decisions. Civil society should be included in the process of planning and developing research through bodies run and chaired by Science Shops. This would enhance public support for intermediaries and raise their status (Germany). Science Shops should continue to act as project coordinators between NGOs and researchers.

In order to find the right partners within the universities, curricula would need to be modified. In Spain demands were expressed for a separate university department for citizens: "raising research needs through surveys or debate groups, to set intervention programmes in motion with a special concern on evaluation, citizen training and research promotion" (Spain). In Vienna demands were made for more research into science and an "improvement of quality standards, against exclusion of women and the feudalistic system working for the university professors." There is also a need to investigate scientifically what universities and NGOs need from intermediaries (Vienna).

To facilitate the dissemination of scientific knowledge to non-academics, appropriate training is needed for the agents of the system science and society, e.g. communication seminars for students (Denmark). In Spain too demands were made

for "scientific spreaders training". Staff from the Science Shops could go on exchanges and/or posts at the university could include places dedicated to practice.

5.3 Summary

The aforementioned ideas reflect themes chosen for debate in the theme groups of the Scenario Workshops. In part they pick up old demands of the Science Shop movement or relate to aspects already being dealt with but with differing levels of success and sophistication in different countries.

Main result of the Scenario Workshops has realistically been the forging of first contacts between important agents in the arena of science and society, particularly within the staff of intermediary institutions, the exchange of views and a strong commitment to continuing and intensified co-operation.

The Scenario Workshops have thus underlined the work of the Science Shops, given them special importance and promoted their enhancement and regional extention. The participants also considered the special working method that became clear in the Case Studies, a closer relation to citizens and a heightened sensitivity to problems of everyday life an important insight. The common vision of a future dialogue between science and society is clearly more democratic and includes demands for an opening and an offer of participation. Science Shops have been promoting such concepts since the 1970s and can feel confirmed in their role as trail blazers.

Ways of enhancing the position of Science Shops and of intensifying the dialogue between science and society are not entirely new. Networking, which was hotly demanded, is already underway but could be improved. Currently it often gets stuck on a formal level or fails due to lack of resources. Here surely there is plenty of room for development. Some necessary tools such as data benches or Internet links exist already and might just need more promotion in order to achieve a higher profile and more hits. Denser regional networking is certainly of the essence and should have priority over international networking. Here national sponsors are needed and need to be motivated.

Changes towards a more open, more easily understandable science, better access for citizens in terms of physical access and understanding will only be achievable in the longer term and only through the concerted effort of many important partners, since some of the demands made by civil society constitute a paradigm shift. Here EU standards can be a decisive help for national contexts that sometimes take on narrow

traditional forms. Just as in the case of gender mainstreaming as a general requirement of projects made by the EU, which has started to crumble national barriers vis-á-vis one gender, a requirement for participatory inclusion of the objects of research into the research process, into the evaluation of the results and the assessment of demand by the EU could contribute to a democratic development of the dialogue between science and society.

Science Shops and the principles and methods they employ could be used as an important link in this development.

6 References

References to executive summary

M. S. Jørgensen (2003): *An introduction to the concept of Science Shops and the Science Shop at The Technical University of Denmark*. DTU. 2003.

SAR

CS analysis

Ws analysis

References for scheme for developing policy options

Hogwood, B & Gunn, L A (1984) Policy Analysis for the Real World, Oxford: Oxford University Press

Jordan, G (2002) NGOs and Risk: The Politics of Changing Decision Venues, in Weale, A (ed) Risk, Democratic Citizenship and Public Policy, Oxford: Oxford University Press for The British Academy

Lindblom, C E (1959) The Science of Muddling Through, Public Administration Review, 19, 79-88

Pretty, J (2002) Genetically Modified Crops: From Principled Stances to Case by Case Analysis, in Weale, A (ed) Risk, Democratic Citizenship and Public Policy, Oxford: Oxford University Press for The British Academy

Simon, H A (1957) Adminstrative Behaviour, London: Macmillan

Stone, D (2002) Policy Paradox: the art of political decision making, New York, Norton

Vickers, G (1965) The Art of Judgement: A study of policy making, London: Chapman & Hall

Weiss, C (1972) Evaluation Research, Englewood Cliffs: Prentice-Hall

Weiss, C (1982) Policy Making in the Context of Diffuse Decision-Making, in Kallen, D, Kosse, G, Wagenaar, H, Kloprogge, J & Vorbeck, M, Social Science Research and Public Policy-Making: a reappraisal, Windsor: NFER-Nelson and Foundation for Educational Research in the Netherlands (SVO)

Wildavsky, A (1980) The Art and Craft of Policy Analysis, London: Macmillan

References for policy recommendations

Gnaiger and Martin (2001): *Science Shops Operational Options*. SCIPAS Report No. 1

Putnam, R. D. (2000) *Bowling Alone,* New York: Simon & Schuster

Schõn, D. A. (1987) *Educating the Reflective Practitioner*, San Francisco: Jossey-Bass

VIVA – the volunteer Investment and Value Audit (Institute of Volunteering Research, 2003). www.ivr.org.uk

White Paper on Governance, Brussels 2001
http://europa.eu.int/comm/governance/areas/group2/report_en.pdf
Institute of Volunteering Research, 2003, www.ivr.org.uk

Pflichter, F., Felt, U., Van der Bellen, A., Elsigan, G., Fischer-Kowalski, M., Nowotny, H., Popp, R., Stagek, W., Zvacek, L.: *Evaluationsbericht des Beirates über die Wissenschaftsläden Graz, Linz und Innsbruck, Vienna: Austiran Federal Ministry of Science, Research and Culture. 1994.*

References for the Methodology of INTERACTS Chapter:

Christensen, T & Joergensen, M (2002) Country Report: Denmark in Fischer C, Wallentin A et al (2002*) State of the Art Report, Interacts Project*

Donmoyer (2000) in Gomm

European Commission (2002) *Science and Society Action Plan*, Brussels: European Commission

Fischer C, Wallentin A et al, (2002) *State of the Art Report, Interacts Project*

Gomm, R; Hammersley, M; Foster, P (eds) (2000) *Case Study Method* (Thousand Oaks, London, New Delhi: Sage)

Hall I & Hall, D *Community based research and science shops: an update on the INTERACTS project,* Discussion paper: Voluntary Sector Studies Network
University of Manchester, 4 November 2002.

Hende, M and Joergensen, M (2001) *The Impact of Science Shops on University Curricula and Research, SCIPAS report 6*, (Utrecht: Utrecht University, Science Shop for Biology)

Leydesdorff, L (2001) A Sociological Theory of Communication: The Self-organization of the Knowledge-Based Society (Universal Publishers/ Upublish.com/2001

Lincoln Y & Guba E (1985) Naturalistic Inquiry (Beverly Hills, CA: Sage)

Platt, J (1992) 'Case study in American methodological thought,' *Current Sociology*, 40, 17-48

Rhoads, R. A. (1997) *Community Service and Higher Learning: Explorations of the Caring Self* (State University of New York Press)

Schön, D (1983) *The Reflective Practitioner: How professionals think in action*, (Basic Books: New York)

Scott, D, Alcock, P, Russell L, and Macmillan R (2000) *Moving pictures: Realities of voluntary action* (Bristol: The Policy Press and Joseph Rowntree Foundation)

Stake, R E (1986) *Quieting Reform* (Urbana: University of Illinois Press)

Stake, R E (1994) 'Case Studies' in Denzin, N & Lincoln, Y (eds) *Handbook of Qualitative Research*, Thousand Oaks, CA: Sage

Strauss, A and Glaser, B. (1977) *Anguish: a case history of a dying trajectory* (Oxford: Martin Robertson)

Yin, R K (1994) *Case Study Research: Design and methods*, 2nd edn, Thousand Oaks, CA: Sage

References for the comparison of scenario workshops

Kromrey, Helmut (2000): Empirische Sozialforschung, 9. Auflage, Leske und Budrich, Opladen,

Calhoun, Craig (2003): Methoden der Sozialforschung, in: Joas, Hans: Lehrbuch der Soziologie, 2. Aufl. Campus Verlag, Frankfurt /New York, 2003,

References to the cross analysis of case studies

DK:
Brodersen, S. & Jørgensen, M.S. (2003): *The Danish National Case Study Report - Improving Interaction between NGO's, universities and Science Shops: Experiences and Expectations.* January 2003. Contact no. HPV!-CT-2001-60039.

FBI:
Gnaiger, A. & Schroffenegger, G. (2003): *Austrian Case Studies Report – The Innsbruck cases - Improving Interaction between NGO's, universities and Science Shops: Experiences and Expectations.* January 2003. Contact no. HPV!-CT-2001-60039.

Germany:
Steinberg, S. & Schophaus, M. (2003): *German Case Studies Report - Improving Interaction between NGO's, universities and Science Shops: Experiences and Expectations.* January 2003. Contact no. HPV!-CT-2001-60039.

Leydesdorff, L. & Ward, J. (2003): *Communication of Science Shop Mediation: A Kaleidoscope of University-Society Relations - Improving Interaction between NGO's, universities and Science Shops: Experiences and Expectations.* January 2003. Contact no. HPV!-CT-2001-60039.

Romania:
Teodosiu, C. & Teleman, D. (2003): *Romanian Case Studies Report - Improving Interaction between NGO's, universities and Science Shops: Experiences and Expectations.* January 2003. Contact no. HPV!-CT-2001-60039.

Spain:
Ahumada, I. & Labatut, A. (2003): *Spanish Case Studies Report - Improving Interaction between NGO's, universities and Science Shops: Experiences and Expectations.* January 2003. Contact no. HPV!-CT-2001-60039.

UK:
Hall, D. & Hall, I. (2003): *UK Case Study Report - Improving Interaction between NGO's, universities and Science Shops: Experiences and Expectations.* January 2003. Contact no. HPV!-CT-2001-60039.

Vienna:
Urban, C. & Reimer, R. (2003): *Vienna Case Studies Report - Improving Interaction between NGO's, universities and Science Shops: Experiences and Expectations.* January 2003. Contact no. HPV!-CT-2001-60039.

References for the comparison of scenario workshops

SCENARIO WORKSHOP REPORTS

7 Appendices