

Executive Summary

WHIST - "Women's careers hitting the target: gender management in S&T research"

Women's under-representation in the scientific and technological research is a complex phenomenon, as it emerges from more than ten years of European policies for gender equality in science, and the issue of supporting women's scientific careers cannot be solved simply adopting an input-output perspective. In light of this, the activities of the project WHIST were planned and implemented in continuity with the FP7 project "Practising Gender Equality in Science" (PRAGES), which highlighted the need to go beyond the numerical data on gender gap in science and to base concerned actions, measures and policies on a deeper comprehension of the difficulties that hinder women's careers.

On this basis, WHIST aimed at improving the **capacity of S&T organisations of managing, monitoring and increasing gender diversity in their midst**. This has been done by planning and fostering a **joint learning process** (led by ASDO and assisted also by the University of Milan, under the supervision of the Italian Department for equal opportunities as project coordinator) in three different organisations in as many countries (namely, Fraunhofer IAO of Stuttgart - Germany, University of Aarhus – Denmark and European Space Agency - France) in order to turn their demand for gender diversity management into a set of experimental activities, aimed at a better understanding of what happens when initiatives to support women in the world of research are actually started and implemented. The project also devised and disseminated tested recommendations for **favouring a structural change in science and technology organisations in Europe**, mainly through the **guidelines** resulting from the project.

As a whole, the process of conception, design and implementation of the WHIST experiments was conducted as a **single path of experimentation and production of new knowledge on gender dynamics in scientific and technological research organisations**. A **holistic approach** (able to take into account the full range of topics and issues to be addressed) **and an analytical one** (grounded on the knowledge of the actual context in which the action takes place) were adopted at the same time, in order to identify the most effective solutions and took in consideration the strategic directions to conduct successful interventions identified through PRAGES, namely: making science and technology an **enabling environment** for women; including **gender dimension** in the whole process of research and innovation; and promoting **women in leadership positions**. The experimental activities were followed by an accompanying research, which used as empirical basis the observation and the collection of information coming from the experimental work, allowing the project team to learn from the concrete experience and build on the lessons learned.

The **University of Aarhus** worked to create a **women-friendly environment** and to **support women's leadership** in science, mainly by: a mentoring pilot programme; several action plans for gender equality at Faculty level; the creation of incentives to hire 20 new women professors; the mapping, in a gender perspective, of factors leading to abandon the University.

European Space Agency tried to **orient the corporate culture to understand, respect and valorise cultural and gender diversity** through the creation of a corporate Institutional Committee, a set of corporate behavioural guidelines establishing common interpersonal standards of behaviour and integrating the gender dimension, a corporate communication campaign on standards of behaviour, a pilot programme to support the partners of ESA women expatriated staff.

Fraunhofer IAO has adopted a **quality-based approach to manage the gender dimension and dynamics in the working environment** in a number of integrated actions, i.e.: two annual reports on equal opportunities; a renewed section of the intranet on gender and diversity; a re-entry support service addressed to employees in parental leave after baby break; a seminar to enhance gender equality.

Through the “**Guidelines on Gender Diversity in S&T Organisations**”, the WHIST team attempted to build on the actual experience and concurrent reflection conducted through the experimentations, formalising the **lessons learned**. These latter concerned: the **obstacles** to the action geared at gender equality; the **capacities** that promoters of gender equality actions can develop and diffuse to achieve the established objectives; the key role of **negotiation** activity, which is necessary in situations where divergent points of view arise; the **size of the interventions**, which often goes beyond the individual research institute, referring instead to a wider sphere of action, even out of the same field of science and technology, acting in the political and regulatory environment at national level. Again based on the experiences carried out, a series of conditions and possible actions are proposed, in order to make a change in scale, triggering a **capacity for social innovation**. The Guidelines also contain a set of **recommendations** for those who want to take a similar path.

The final outcomes of WHIST have been presented and discussed in a final public conference in Brussels (November 7th 2011). The project lasted 31 months (May 2009-November 2011) and has been co-financed by the Italian Government. See more at: <http://www.retepariopportunita.it/defaultdesktop.aspx?page=3414>

Summary description of the project context and objectives

Despite over ten years of interventions geared at promoting equality among women and men in scientific research, in the European Union, as well as all around the world the **gender gap remains wide**. This entails an important waste of talents and a general risk for member states and individual research organisations to lose competitiveness. Studies, measures and actions in this regard have been the object of intense debate which has gradually revealed the **need for a new paradigm for policies to promote women in science**. According to the European Commission, indeed, these policies should more and more aim at strengthening the research and innovation capacity of research institutions, through a structural change focused on the valorisation of all the different skills and competencies available.

This is the strategic and political framework of the Supporting Action “Women’s careers hitting the target: gender management in scientific and technological research” – WHIST, funded under the FP7 Capacities, Work Programme 2008 “Science in Society”, topic 2.1.1.1. and co-financed by the Italian Government, through the Inspector General for the financial relations with the European Union of the Italian Ministry for Finance and Treasure – IGRUE.

The project WHIST has been carried out with the **general aim of improving the capacity of STR organisations of managing, monitoring and increasing gender diversity in their midst** with the awareness that making full use of both male and female human resources and scientific talents contributes to the advancement of science and to a higher level of innovation in the European context.

In order to achieve its goals, the project has been implemented through several interconnected activities. Specifically:

- the drafting of a first set of guidelines for planning experimental initiatives for the management of gender diversity in scientific and technological organisations (WP2);
- the organisation of three workshops for starting the implementation of the experimental initiatives for the management of gender diversity (WP3);
- the testing of experimental initiatives for the management of gender diversity (WP4, WP5 and WP6);
- the implementation of a common program for supporting the experimental initiatives (WP7);
- the drafting of guidelines for managing gender diversity in scientific and technological organisations (WP2);
- the conduction of a series of public communication activities (WP9);
- the organisation of a final conference on the management of gender diversity in research organisations, based on the WHIST results (WP8);
- the use of procedures of project management aimed at achieving and maintaining a high level of quality of results and at ensuring technical and administrative coordination (WP1).

The project WHIST has been implemented by a Consortium led by the Italian Department for Equal Opportunities of the Presidency of the Council of Ministers (DPO) and composed of the following partners:

- the Fraunhofer Gesellschaft – Institute for Industrial Engineering (IAO) - Germany;
- the European Space Agency (ESA) - France;
- the Danish Centre for Studies in Research and Research Policy of the University of Aarhus (AU) - Denmark;
- the Centre for Study and Research “Women and Gender Differences” of the University of Milan (UNIMI) - Italy;
- the Assembly of Women for Development and the Struggle against Social Exclusion (ASDO) - Italy.

The activities were performed from May 2009 until November 2011 (31 months).

WHIST has been carried out in direct continuity with the Coordination Action “Practising Gender Equality in Science” - PRAGES, also coordinated by the Department for Equal Opportunities and involving 4 out of 6 WHIST partners, which implied the analysis of 125 good practices in Europe, North America and Australia and the formulation of the “Guidelines for Gender Equality Programmes in Science” (2009).

PRAGES stressed the need to overcome the merely quantitative aspects of the gender gap in science and to base actions and policies aimed at supporting the participation of women in scientific and technological research on a deeper understanding of the difficulties that hinder female careers.

In particular, PRAGES has shown that, to make an impact and get results in the medium and long term, actions for gender equality need to adopt at the same time a holistic approach (able to take into account the full spectrum of topics and issues to be addressed) and an analytical one (grounded on the knowledge of the actual context in which it takes place), in order to identify the most effective solutions.

On this basis, three strategic directions to conduct successful interventions have been identified, namely: to make **science and technology an enabling environment for women**, to include the **gender dimension in the whole process of research and innovation** and to promote **women in leadership positions**.

The Supporting Action WHIST, adopting PRAGES strategies, was geared to **better understand what happens when initiatives to support women in the world of research are actually started**, in order to **formulate the specific guidelines issued at the end of the project**.

To this end, the project was centred on the implementation of **three experimental initiatives of gender diversity management**, carried out at the **European Space Agency - ESA** (a public entity engaged in scientific research at international level) in France, the **Fraunhofer-Institut für Arbeitswirtschaft und Organisation - IAO** (an industrial research institute of the Fraunhofer-Gesellschaft) in Germany and the **University of Aarhus – AU** (a public university) in Denmark.

All these institutions tend to be male-dominated and have long been committed to equal opportunities and the change of working conditions in a perspective of work-life balance. By giving primacy to the aspect of concreteness, the project aimed to generate new knowledge from the direct observation of what happened in the three research bodies, when specific actions to change the organisational set up were carried out into them.

Since many phenomena of gender discrimination are rooted in deep and often unrecognised mechanisms, they can be made visible only through action. In this sense, the original contribution of WHIST consisted, not only and not so much in the completion of the three experimental actions, but in the **observation of the activities under way** in order to draw useful lessons for those who wish to foster structural change, that is durable and of great scope, in gender relations within scientific organisations. Obviously, the three experimental initiatives were pilot projects, both for their short length and for their limited size, so that their effects probably will become fully visible in a longer span of time than that of the duration of WHIST project.

As a whole, the process of conception, design and implementation of the WHIST experiments was conducted as **a single path of experimentation and production of new knowledge** on gender dynamics in scientific and technological research organisations.

The design was carried out between July 2009 and February 2010 through a participatory process, called Experimentation Planning Road Map (EPR), including a first preliminary phase of conception resulting in one project idea for each concerned institute, involving key stakeholders internal and external to the three bodies concerned and the other European partners of the project WHIST.

The experimental activities were carried out between March 2010 and May 2011. To promote their good performance, while maintaining the unity of the experiment and the exchange of ideas and experience between partners, a joint program of support for experimentation (JESP) was established, which provided the central coordination, monitoring and work in progress evaluation, as well as a working seminar of three sessions, that were convened at the beginning, middle and end of the activities.

As for the content of the three experimental initiatives, **Fraunhofer IAO** has adopted a **quality-based approach to manage the gender dimension and dynamics** in the working environment through a number of integrated actions. These included the draft of two annual reports as a tool for the development of “gender quality” in the organisation; the improved dissemination of information on gender and diversity at the Fraunhofer IAO intranet; the design of a support-service to parents returning to work after parental leave and the design and test of a seminar on gender diversity aimed at newcomers.

ESA effort was addressed to orient the corporate culture to **understand, respect and valorise cultural and gender diversity** by means of the creation of an institutional “Committee” promoting optimal quality of working life for women; the design and dissemination of Corporate behavioural guidelines integrating the gender dynamics; the promotion of a communication campaign on behavioural standards, prevention of unacceptable behaviours and gender diversity at ESA; the implementation of a pilot programme to support expatriate partners’ work.

Aarhus University worked to create a **women-friendly environment** and to **support women’s leadership** in science, through two actions, namely the support to the design and implementation of the action plans for gender equality in a number of faculties and departments and the support for the implementation of a mentoring pilot programme for young women researchers from two faculties. During the experimentation, two additional actions have been designed and implemented, i.e. incentives for women to follow a career at Aarhus University by establishing 10 new positions at associate professor level and 10 new positions at professor level. Besides, the

reasons why researchers leave Aarhus University or science in general were mapped in a comparative gender perspective.

To yield the desired effect from the point of view of the production of new knowledge, the experimental activities were followed by an **accompanying research**, which used as empirical basis the observation and the collection of information, carried out through special instruments, but has also made use of all the documentation produced in the course of experimental work.

The main output of the projects have been the “**Guidelines on Gender Diversity in S&T Organisations**” which are an attempt to build on the actual experience and concurrent reflection conducted through the experimentations in WHIST, formalising the lessons learned. The Guidelines have been presented during the Final Conference of the Project which was held in Brussels on November 7th 2011.

To enhance the project results, WHIST has been accompanied by a **set of communication activities**, including the project website, 4 issues of the project newsletter, 2 policy briefs and the presentation of WHIST activities and outcomes in Europe and worldwide.

Description of the main S&T results /foreground

The project WHIST has represented an opportunity to **study what happens, what obstacles arise, what resources can be mobilised and what effects are produced in S&T organisations while changes affecting gender balance are under way**. For this reason the most important results have been obtained during the experimentation phase.

The experimental activities have been carried out starting from the following project PRAGES strategies (see before):

- The creation of a **women-friendly environment** is a necessary preliminary condition to achieve positive changes in science-gender relations within S&T organisations. This strategy is geared to eliminating the many and often imperceptible factors contributing to hindering women in all aspects of their working life and making them feel outsiders in the science field.
- The second strategy is geared to supporting the **construction of a science that is aware of the gender dimension**, in order to counter the false neutrality attributed to science and to overcome the consequent imbalance that tends to privilege the male dimension in this sphere. This imbalance is at the heart of lasting forms of both vertical and horizontal segregation of women in research, and produces effects on scientific activities themselves.
- The third strategy concerns the **promotion of women to key positions in scientific and technological research** as well as in the governance of research institutes, including those positions dealing with the management of S&T organisations, scientific communication, innovation and evaluation of S&T. Women's greater access to leadership positions would not only restore a condition of equal opportunity but could have positive effects - partly still not predictable - on science policies, career profiles, relations between science and society, and on the quality of scientific research itself.

The features of WHIST experimentations were determined by taking into account the indications to translate these strategies into concrete actions.

WHIST experimentations took place in three partner organisations: the Fraunhofer Gesellschaft, more precisely the Fraunhofer-Institut für Arbeitswirtschaft und Organisation IAO (Fraunhofer IAO) in Stuttgart (Germany) and the belonging Institute for Human Factors and Technology Management of the Stuttgart University (IAT), the European Space Agency (ESA) in Paris (France) and Aarhus University in Aarhus (Denmark). The activities lasted 16 months (February 2010 - May 2011).

The experimental activities were designed between July 2009 and February 2010 using the Experimentation Planning Road Map (EPR). The EPR allowed the three promoting organisations to make a situation analysis of gender equality in their organisations. From an initial identification of the general orientations vis-à-vis the contents and objectives of their experimentations and taking into account PRAGES results, the ideas for the design of the activities were defined (November 2009). The design ideas were then transformed into executive projects (February 2010), after checking with key actors in the sponsoring organisations and other WHIST partners. The design phase coincided with the start-up workshop of the experimentations (coordinated by the University of Milan) in February 2010.

In designing the experimentations, reference was made not only to the theoretical content of the PRAGES guidelines but also to some assumptions.

The first one was the **unitary nature of the experimentations**, being part of a single experimental action intended to produce new and broader knowledge on the factors that can increase or reduce the capacity for impact of gender equality programmes in science and technology.

The second was the **priority of knowledge**, which links the success of the experimentations not only to their capacities of triggering transformation processes within the organisation, but also and equally to their capacity of generating new knowledge on gender dynamics in science and technology, considered as a priority as much as it was attaining their practical objectives.

The third was the **significance of the experimentations' success** for the whole WHIST Project output.

The fourth was the **key role of the accompanying research**, being the observation of the experimentations in their making of pivotal importance, both for their success and for that of the WHIST Project.

The accompanying research, led by ASDO, has been aimed to study the feasibility conditions of measures functional to the promotion of women in science and it provided an in depth analysis of the dynamics and actors involved in the production of forms of gender discrimination in science.

Last but not least, and connected to the accompanying research, the exchange of information, data and opinions among the experimentation staffs has been considered of pivotal importance.

To favour their success, preserve their unitary nature and promote exchange of information and data among WHIST partners, the three experimental activities have been accompanied by a Joint Experimentation Support Programme, coordinated by ASDO. The programme has been organised into three main components.

- 1) ASDO established a “virtual” operations room at its premises, in order to support the partners implementing the pilot initiatives. Through the operations room technical assistance activities have been provided and communication flows between the partners have been handled.
- 2) Monitoring activities have been implemented in order to check the actions, to assess their progress and to produce the information for the continuous evaluation process. Two monitoring modalities have been used, adopting two different approaches, i.e. a technical approach (implementing the work plan) and a qualitative approach (resolving specific problems and non-technical issues).
- 3) The Working Seminar was geared at presenting and discussing the findings of the accompanying research, illustrating the monitoring and evaluation activities, and facilitating the information exchange among all consortium members and staffs, so as to support experimental activities and, after their completion (June 2011), to outline the contents of the Guidelines for the management of gender diversity. The Seminar included three sessions (April 30th 2010, October 28th 2010, June 15th 2011), respectively at the beginning, in the midst and at the end of the experimental activities.

1. THE EXPERIMENTAL ACTIVITIES

1.1. Fraunhofer – IAO

General features and aim of the experimentation

Fraunhofer-Gesellschaft's human resource policies have, for many years, pursued objectives regarding gender issues such as the practice of a proactive culture of equality, the search for a balanced mix of men as well as women in research teams, support of work-life balance, research projects planning from the gender perspective and the adoption of gender mainstreaming in corporate strategies.

These general guidelines are followed in different ways by the 80 different Fraunhofer-Gesellschaft research facilities of which 60 are institutes, each of which is relatively autonomous in terms of activities undertaken and management policies. Gender equality, sensitivity and needs are different in the various institutions, with different situations in terms of number of women and awareness levels of management and staff on gender issues.

The Fraunhofer-Institut für Arbeitswirtschaft und Organisation IAO was founded in 1981. The activities of the Fraunhofer IAO focus on investigation of current topics in the field of technology management. Research projects are conducted in close collaboration with small and medium-sized companies and industrial corporations under direct contract. Through its close cooperation with the Institute for Human Factors and Technology Management (IAT) of the University of Stuttgart, Fraunhofer IAO unites basic university research with applied science and business practice. Both institutes employ a staff of over 400. Amongst them are mainly engineers, computer specialists, economists and social scientists. Fraunhofer IAO, in particular, decided to carry out its own experimentation to develop and offer actions and services supporting the staff to work at the best way possible. Fraunhofer IAO experimentation also involved the switch from an equal opportunities approach to one based on quality, in which the management of gender dynamics can help driving development and organisational improvement. In this framework, the prevailing strategy this experimentation coped with was the one aimed at the

creation of a friendly environment for women. But it was also important for Fraunhofer IAO to make sure that the chosen actions contribute to an increased visibility of women in the area of applied research and to an improved awareness of possible gender specific questions related to the research topics they are occupied with.

Actions

The actions were aimed to link existing offers that facilitate gender diversity at Fraunhofer IAO with newly implemented actions and services. More specifically, the entire experimentation on improving gender-quality involved four main actions:

1. draft of two annual reports, as a tool for the development of gender quality in the organisation;
2. improved dissemination of information on gender and diversity at the Fraunhofer IAO intranet;
3. design of a support-service to parents returning to work after parental leave;
4. design and test of a seminar on gender diversity aimed at newcomers.

Main outcomes

As for the two annual reports (Action 1), it has been decided to change the character of the reports from reports on equal opportunities (EO) to an instrument of gender-quality development. It was also decided to deliver one “comprehensive report” once a year and a second but also large “intermediate report” four to eight months after every “comprehensive report”. The “intermediate report” focuses on activities with regard to contents and the development of gender diversity quality at the Fraunhofer IAO. The WHIST-teams’ suggestion to list BfC-reports (the German acronym for “Women in charge for Equal Opportunities”) as an explicit agenda item was picked up by the director in charge for personal affairs in order to make the BfC concerns more visible at the ILA meetings (ILA - Institutes Leading Committee, which consists currently of 37 leaders of a total staff of about 250 employees). The suggestion was introduced by him at an ILA meeting and was accepted by the body.

Both the short reports at every ILA meeting as well as the two annual reports have now more weight within the ILA meetings. It will in the long run lead to a stronger perception and recognition of gender items. They will become a matter of everyday considerations and will lose the image of being something special.

As a result of Action 2, the new intranet presentation offers much more information and support for young families but also for other social situations. Thus it has changed to a more precious place and more visitors are expected as there have been in the last years. The online survey addressed to the whole staff about the Intranet has shown that the participants appreciate the new designed intranet and that they are interested in the topics diversity and equal opportunities. This also raised many suggestions for improving the intranet offer.

In the framework of the Action 3, a baby present (a romper suit for the baby with a greeting card from the direction) is offered to all female and male employees at the Fraunhofer IAO becoming parents and a seminar has been held for returners after their baby break. Overall, the evaluation of the feedback-forms has shown that the participants appreciated that new parents are given a baby welcome package. The baby present, as well as the information offer in the intranet in the Action 2, is a good measure for showing employees with children the esteem of the institute and they can contribute to a family-friendly working environment. Still, also on the basis of the answers, it can be stated that giving a baby welcome present cannot be sufficient. There is need for improvement especially concerning the provision of relevant information for new mothers and fathers, e.g. child day care options at the respective institute and offers like the seminar on re-entry after parental leave.

The workshop on gender diversity (Action 4) aimed at identifying urgent changes and was created as part of a continuous improvement system that should improve gender diversity aspects at the Fraunhofer IAO. On the basis of the test conducted through the WHIST experimentation, it has been decided to adapt the experimentally executed workshop conception and the schedule for the acquisition of participants.

Anyway, as it has been concluded by the experimentation team in its final report, most of the changes reported on will have their effects after the WHIST project is finished.

1.2. European Space Agency (ESA)

General features and aim of the experimentation

The European Space Agency (ESA) is Europe's gateway to space. Its mission is to shape the development of Europe's space capability and ensure that investment in space continues to deliver benefits to the citizens of Europe and the world. ESA is an international organisation with 18 Member States. By coordinating the financial and intellectual resources of its members, it can undertake programmes and activities far beyond the scope of any single European country.

ESA's headquarters are in Paris which is where policies and programmes are decided. ESA also has centres in a number of European countries, each of which has different responsibilities.

ESA follows an equal opportunity policy since 2002, the main purpose of which is to improve the representation of female staff, particularly in engineering and scientific fields, and at management level.

In 2007, in light of the success of its equal opportunity policy in previous years, ESA decided to drive new initiatives from a broader point of view: diversity. Enriched by this inherent diversity in languages and cultures, the challenge for ESA was to realise the full benefit of it to create a supportive work environment that enables people from diverse backgrounds to perform at highest levels, fully contribute to the organisation and feel professionally satisfied. To maximise diversity ESA had to design and implement internal processes to value everybody's viewpoints and to develop for everyone the opportunity to develop skills and talents.

In 2009 ESA decided to launch a wide programme named "Life at ESA", including all initiatives meant to improve quality of life at ESA, satisfaction at work and an healthy and motivating working environment, supporting career development of minorities, including women. The "Life at ESA" Action Plan has been developed dedicated to maximise the potential of expertise and diversity in the organisation. This Action plan dedicates a large attention to understanding and respect for cultural and gender diversity.

This plan has been promoting new governance and questioning the existing organisational culture. It is well known that minorities are more fragile regarding the balance of a satisfying work environment. At ESA women are still in a large minority at all levels of responsibilities. Even if they are not the only victims of misbehaviour on the working place, they should receive particular attention and support.

This has been, therefore, the context for the actions of ESA's experimental activity, promoted and implemented by the Division for Equal Opportunities and Diversity Management. These actions pursued the following general aims:

- change corporate culture and attitude;
- increase awareness on gender diversity management;
- create optimal conditions to enable ESA women to develop professionally in a friendly work environment.

The experimental activity aimed at creating a women-friendly environment as its prevailing strategy, indirectly addressing also the issue concerning the building of a gender-aware science.

Actions

The European Space Agency selected the following four actions to undertake its experimental activity:

1. creation of an institutional "Committee" promoting optimal quality of working life for women;
2. design and dissemination of Corporate behavioural guidelines integrating the gender dynamics;
3. promotion of a communication campaign on behavioural standards, prevention of unacceptable behaviours and gender diversity at ESA;
4. implementation of a pilot programme to support expatriate partners' work (the action has been reoriented to an earlier stage as it has been realised that there was a lack of information and internal data on the female expatriation "statu quo").

Main outcomes

In the framework of the first action, very diverse people joined the **Committee** and all had the same “tone of voice” to give their views and opinions on different initiatives, proposals or projects. Several members have played an important part in the process with active participation in the other actions of the WHIST project. The Committee has been able to promote the involvement of women and the incorporation of a gender perspective in the design, approval and execution of the behavioural guidelines. The Committee has also piloted the new seminar on Managing Diversity in February 2011 which main objective was to give to managers the knowledge, tools and techniques they need to make the best of their cross-cultural teams. It was also about being aware of the current working culture, managing cultural shock, mental programming and above all becoming aware of one's own bias. The Managing Diversity has been delivered so far with 10 one and half-day sessions to ESA managers in five establishments located in different European countries. With the adoption of a holistic, coordinated and collaborative approach, the experimentation team managed to integrate a gender perspective to be sustainable in a longer-term. The main result of this action is that its members have addressed in May 11 a paper to DG on the preparation of ESA Agenda 2015 to integrate “Life at ESA” topics into ESA strategic objectives.

The development of the **behavioural guidelines** (Action 2) permitted to integrate the results of gender-sensitive research previously carried out at ESA into mainstream policies with a view to developing sustainable knowledge and understanding across the Agency on what is the standard of behaviour in such a multicultural and complex work environment. The behavioural guidelines are now associated with “Life at ESA” programme and perceived by staff as a reference document to check the behaviours of each but more importantly their own behaviour compared to and vis-à-vis others colleagues. With the collaborative approach in producing the guidelines, it gives more acceptability and credibility to the document as staff had the opportunity to give their input and feedback which was, when pertinent, integrated into the final version of the guidelines.

The **Communication campaign** (Action 3) has enabled to start a process of generating greater commitment and motivation from staff. The four posters developed on behavioural standards at ESA and promotion materials (such as pens) with the four behavioural principles have been produced and delivered to the different ESA sites. The Communication campaign has enabled to go beyond producing studies and reports, as it is more about changing the way staff members work together, also enhancing their feeling of being part of the project, so contributing to its success. A wiki has been fully developed and open to more than 2,000 staff members. The experimentation included the launch of a new series of “Women at ESA” articles which staff feedbacks were extremely positive as they felt it was the first time women were asked the right questions regarding their career perspectives and evolution and the difficulties they meet in their daily work life.

The **survey** carried out on **Expatriation conditions at ESA** (Action 4) was successful, as 33.6% of ESA expatriate population have participated and given their return on experience on the constraints they face and the support they need and expect from ESA. It is a representative and fair sample of the ESA expatriate population of 1,517 staff, including 510 staff; 131 women (25.7%) and 379 men (74.3%) have replied to the questionnaire, of which 469 (92% of the respondents) have fully completed it (i.e. answered to all questions). It allowed a better knowledge and awareness of expats situation and specific difficulties of women in their career and made possible to identify corrective actions to offer to staff more adequate support according to their needs and constraints.

1.3. University of Aarhus

General features and aim of the experimentation

Aarhus University is a leading European research university with education and research activities in all scientific and scholarly disciplines. The university attracts 25 per cent of Danish research funding, hosts 15 Centres of Excellence supported by the Danish National Research Foundation and has been awarded several European Research Council advanced grants and starting grants. Aarhus University is one of the most rapidly advancing institutions ranked among the top 100 universities in the world with approximately 40,000 students and 11,000 members of staff.

In 2008 Aarhus University signed the "Charter for more women in management" put forward by the Danish Government's Ministry for Gender Equality to raise awareness and the need to increase the number of women, among others in universities, particularly in leading positions. To make the commitment to the principles of the Charter effective, the same year Aarhus University set up a special Task Force for Gender Equality, which worked

to define a human resource strategy to improve the research environment and make it more attractive for all researchers, which included the aim of increasing the participation of women at all levels.

The principles of this strategy were designed to emphasise the awareness of the gender issue, in particular in relation to some "critical areas" for women's career development opportunities (assessment, selection, promotion) and access to scientific leadership. To apply these principles, the Task Force also identified a number of strategies concerning, inter alia, flexible working arrangements, support to career development through coaching, mentoring, activation of child-care services, leadership awareness, and academic management of the gender dimension.

It was in this context, therefore, that WHIST's experimental activity was developed, to be promoted and implemented at Aarhus University by the Danish Centre for Studies in Research and Research Policies. The experimental activity at the University of Aarhus mainly referred to the strategy aimed at the creation of a women-friendly environment, taking also into account the strategy concerning the support to women's leadership in science.

Actions

Aarhus University's experimental activity consisted of two actions promoted by the Task Force on Gender Equality:

1. support to the design and implementation of the action plans for gender equality in a number of faculties and departments;
2. support for the implementation of a mentoring pilot programme for young women researchers from two faculties (16 mentees from the Faculty of Sciences and from the Aarhus Business School).

Two new actions were introduced during the experimentation:

- A. incentives for women to follow a career at Aarhus University by establishing 10 new positions at associate professor level and 10 new positions at professor level;
- B. mapping, in a comparative gender perspective, the reasons why researchers leave Aarhus University taking on positions in other organisations or leaving science in general.

Main outcomes

As for the outcome of the action plans (action 1), the total development in the share of women scientists at all levels in the different faculties since 2008 sums up to 2.9%, with high increase in the National Environmental Institute (7%) and Health Sciences (6.5%), while the difference in the share of women associate professors is 1.6% but in particular in the Faculty of Science and Health Sciences is very high (namely 4.3% and 3.5% respectively). The big difference is generated in the category of full professors where the increase is calculated to 3.5 %, with the Health Sciences, the National Environmental Institute and the Aarhus School of Business showing the highest increase with 13%, 7,7% and 4,4 % respectively.

The evaluation of the mentoring programme (action 2) reveals very positive experiences as expressed by both mentees and mentors participating in the programme. All the interviewees agree that it should become a permanent arrangement, implemented also to the remaining scientific areas at Aarhus University and emphasise the need for mentoring at Aarhus University. Mentors consider mentoring necessary not only from a personal point of view but also from an institutional perspective in order to develop the university as a whole.

As to the action on hiring women professors (Action A) the university management decided to implement the action to start from February 2011. As the experimentation was concluded in May 2011, effects and impacts of these activities have not been possible to assess in this early stage of operation.

The mapping, in a comparative gender perspective, of the reasons why researchers leave Aarhus University (Action B) taking on positions in other organisations or leaving science in general, carried out through an investigation of 32 researchers (16 male and 16 female) with a PhD, showed that the reasons why women and men researchers choose to leave Aarhus University are quite similar.

However, the study also confirms that the female researchers seem to suffer more in particular due to academic work conditions (long work hours, stress, lacking time to do research), the conditions in the academic work environment (competitiveness, loneliness, lack of recognition) and the insecurity when it comes to job opportunities and career development. At the same time the study reveals a lack of workplace support to overcome the problems forcing the female researchers with young families to leave the workforce in a higher rate than their male colleagues.

2. LESSONS LEARNED THROUGH THE ACTION-RESEARCH PATH

The first major lesson was to understand that interventions for the promotion of gender equality in science are areas of action that come up against an **articulated and complex set of obstacles**, which should, first and foremost, be identified and studied using specific tools. The experimentation and research carried out in the WHIST project offered the promoters an opportunity to recognise, formalise and catalogue obstacles hindering actions to promote gender-sensitive science. The dimension and complexity of the obstacles give rise to a reflection on the scope of the interventions, which often transcends the framework of a single gender balance programme or a single scientific organisation.

The second lesson concerns the existence of and the need for a **set of capacities** to address gender inequality in research institutions, which clearly came out of the experimentation. The term capacity seems to be the best way to represent what happened in the organisations that participated in the WHIST experiment. These capacities, in fact, emerged as qualities which, once activated, were able to produce effects in terms of change. What is clear is that they are **based on different forms of negotiation** which the three institutions had to activate to overcome the opposition of hostile, or at least not entirely favourable, environments to initiatives such as those proposed.

Prompted by the difficulties encountered and the capacities brought into play to achieve the project goals and overcome the obstacles, the joint experience of the experimentation and accompanying research led to the formulation of a series of **concrete recommendations** for gender equality policies in science.

The experimentation confirmed the importance of taking account of **two dimensions of change**, when undertaking gender equality initiatives. The first includes predominantly **cognitive and intangible aspects**, such as the interpretation and awareness of gender inequality in science, as well as the motivation to act to remove the factors of discrimination. The second is the **possibility of having a concrete impact on reality**, producing changes in the institutional dynamics and operational set-ups of research institutions. For this reason, the presentation of the obstacles, capacities, and recommendations in the final guidelines are organised on the basis of these two dimensions.

It is also believed that the secret of transforming the successes and progress made by research institutions towards gender equality into lasting changes lies in the activation of an **overall capacity to exploit the internal changes** in the institutions concerned **to trigger forms of social innovation**.

Hereinafter, the content and outcomes of these lessons are better described and detailed.

2.1. Obstacles as a risk factor for action

The three institutions involved in the WHIST project were able to see immediately that the experimentation involved a complex course of action, exposed to many risk factors, due to large and small difficulties which had to be first of all recognised and identified.

Not always, in fact, did things go in the direction hoped for by the promoters, and sometimes the results were disappointing compared to the efforts made. In some cases, the beneficiaries did not fully understand or appreciate the actions targeting them, in others it was not possible to maintain the enthusiasm generated at the beginning. Sometimes the actions with most chances of success were actually taken over by other departments of the target institution, excluding those who had designed them. In most cases the initiatives were successful, partly because the emergence of obstacles resulted in an organisational learning process capable of finding ways to overcome them.

A first result of the experimentation and the accompanying research, therefore, was precisely the identification, determination and classification of obstacles encountered during the implementation of gender equality measures. Several factors hindering the development or deployment of capacities for action on gender were described and catalogued, aided by reference to international literature. 53 obstacles (see summary table) were identified and classified, according to two different dimensions. The first (interpretive and motivational dimension) is the interpretation of gender discrimination in science, the awareness of stakeholders and, consequently, their mobilisation. The second (institutional and operational dimension) concerns the institutional and operational arrangements of scientific organisations and the possibility that the desired transformations could actually take place.

Summary table n. 1 – Obstacles

INTERPRETIVE AND MOTIVATIONAL DIMENSION	
Obstacles stemming from the hidden structure of discrimination	
1	Explicit denial of the phenomena of discrimination
2	A purely organisational perception of problems
3	Women researchers' discomfort with visibility
Unavailability of information and knowledge	
4	Lack of gendered statistics in research institutes
5	Unavailable or inaccessible information on research institute staff
6	Lack of information on previous experience in other organisations
In-house communication problems	
8	"Stereotypical" gender communication by research institutions
9	Inadequate in-house communication methods
10	Difficulty in planning communication activities
11	Poorly publicised policies in research institutions
12	Absence of institutional communication channels with other promoters of gender equality actions
13	Lack of relations between science organisations and government offices
14	The isolation of scientific research institutions engaged in gender equality policies
Forms of dissent	
15	Resistance to gender-related interventions
16	Use of the argument of meritocracy to justify a lack of commitment on gender issues
16	Stigmatisation of women involved in positive action
17	Male hostility towards affirmative actions addressed to women in research institutions
18	Gender bias igniting conflicts among women
Poorly motivated actors	
19	Lack of interest in gender issues among research institution managers and leaders
20	Indifference of the staff in research institutions
21	Divergent visions and motivations in the different departments/faculties involved in programmes
22	Difficulties in getting beneficiaries to become involved in actions
23	Lack of motivation and specific expertise in managing projects related to gender
Organisational and bureaucratic dynamics affecting the involvement of actors	
24	Implementation of gender equality actions depending on other sectors of the research institute
25	Overworked staff in research institutes
26	Difficulties in maintaining post-project relations
27	Ineffective monitoring systems
28	Divergences between scientific organisations and project partners
29	Problems in solving difficulties in mentorship relations
30	Difficulties in designing and implementing appropriate initiatives for women with high level jobs
31	Tendency to delegate decisions to managers

INSTITUTIONAL AND OPERATIONAL DIMENSION	
Regulatory conflicts or deficiencies	
32	"Positive discrimination" as a legal impossibility
33	Institutional confusion due to different regulations in different institutions
34	Gender issues in scientific organisations are included in the fields of social policy and labour law
Organisational barriers	
35	Timetable constraints and mandates of staff in charge of equal opportunities
36	Managers involved have too many commitments
37	"Expropriation" of project activities by other sectors of the research institution
38	Unwillingness of personnel not directly involved to work/participate in projects
39	Intra-organisational conflicts in research organisations
40	Administrative opposition to the implementation of specific project requirements
41	Insufficient administrative support to the project team
42	Inadequate allocation of human, technical and logistical resources
43	Lack of economic coverage for the work-time spent on projects
Structural inertia	
44	The negative effects of decentralisation and organisational autonomy
45	Negative effects of the geographical decentralisation of research institutions
46	Long, drawn-out activities due to bureaucracy in research institutes
47	High turnover of staff in charge of equal opportunities
48	Change of priorities during restructuring processes in large academic/business institutions
49	Need to redefine the projects on the basis of funding rules
50	Bureaucratic problems linked to financial management and reporting procedures
Effects of the economic crisis	
51	Changes in corporate priorities due to the economic crisis
52	Cutting/downsizing activities already budgeted
53	Cognitive effects of the economic crisis

The interpretive and motivational dimension

Many of the obstacles encountered during the experimentation regard the interpretive and motivational dimension of the actors involved, aspects that are mainly of a cognitive nature and which are often the least obvious.

The first set of difficulties encountered by the experimentation regard the **hidden nature of the discrimination** that characterises virtually all male-dominated work environments, science and technology research institutes being no exception. In such environments, as was observed directly, even the women themselves are inclined to deny the existence or the significance of gender issues. It should not be taken for granted, therefore, that an organisation decides to initiate or strengthen actions in support of gender equality. This is certainly true of research organisations, where there is a very widespread opinion – largely disproved by the facts – that the rules governing scientific activity (meritocracy, result-orientation, etc.) in themselves prevent the emergence of forms of discrimination.

Other obstacles to the initiatives in the experimentation regard the **production of information and knowledge** to document the presence of factors contributing to gender discrimination in the target organisations. It was not always easy to counter the scepticism of many internal interlocutors, because this type of initiative was, in many ways, unprecedented in the three organisations, hampered by privacy issues or the impossibility of accessing complete or updated information on the staff.

Moreover, the three experimentation teams also had to deal with **communication dynamics inside and outside** the research organisations. Often this communication is slow and inadequate and tends to reproduce gender stereotypes or stereotypes concerning the fundamental characteristics of research or scientific disciplines. Thus, for example, it was not always easy to make use of internal communication tools such as the intranet, characterised by rigid protocols or obsolete set-ups.

Furthermore, the investigators ran into **various forms of dissent**, which usually remain more or less latent but which exist and inevitably emerge when initiatives are taken, becoming visible and raising issues that are usually not talked about. This happens even more often when the measures taken are to the advantage of a particular group (such as women), apparently at the expense of other groups, who may feel discriminated against (such as young male researchers).

As well as open dissent, the attempt to mobilise human and material resources for the implementation of planned activities also came up against **a lack of motivation among the actors involved** in them. In addition to the general indifference of the male staff to gender issues, in some cases the various departments involved and the beneficiaries themselves had divergent views. In a scientific organisation, especially if large, it does not always follow that a decision made by management to accept a project is shared by those who must then implement it, or that its objectives and its content are interpreted in the same way by everyone. This is certainly true of institutions which have multiple decision making bodies and which may not all be located in the same city (or even the same country), like some of those in which the experiments were conducted.

The difficulties in motivating and mobilising people seemed in many cases to also be closely interrelated to **organisational and bureaucratic dynamics**, which greatly affect their actual involvement, such as excessive workloads, difficulties in developing monitoring mechanisms, dependence on areas and departments of the institution which have different priorities and work schedules to those of the promoters.

The institutional and operational dimension

During the experimentation, as already mentioned, many of the obstacles found were also of an institutional and operational nature, some of which are macroscopic in dimension.

First, the experimentation came up against **regulatory conflicts or deficiencies**, which can make it impractical or extremely difficult to implement even measures enjoying broad consensus in research institutes. For example, a national law or the constitution itself can prevent the implementation of positive discrimination, even when a particular group has been shown to be at a disadvantage.

In addition, the experimentations often had to face a series of **organisational barriers**, i.e., small and large-scale issues regarding, for example, the allocation of resources, the arrangement of working hours and contracts, intra-organisational and interpersonal rivalries that characterise all organisations, especially complex ones. In several cases, these factors weighed heavily on timelines and the probability of success.

But more than contingent factors, what became of central importance for the experimentations, as it would be for any reform process, was a kind of **structural inertia** that characterises the normal operation of large institutions, especially public ones, which makes any change difficult and slow. Aspects such as high staff turnover in some sectors, cumbersome administrative and bureaucratic procedures, the negative effects of some institutional characteristics such as geographical decentralisation, or organisational and decision-making autonomy, slowed down and complicated planned activities.

Last but certainly not least, there were the **effects of the global economic crisis** to contend with, which has immediate effects on the priorities of institutions and their ability to effect decisions already taken (due to staff cuts, for example, or a changes in priorities in the calendar of activities).

In the light of all the obstacles listed above, the experimentation and the accompanying research made it possible to redefine the arena for change. Progress towards gender equality, in fact, requires changes in institutional set-ups, organisational cultures, and the current practices of research institutions. The creation of a deep and irreversible impact on these issues goes beyond the scope of internal policies, whether they are specifically aimed at balancing gender, or a more prudent management of human resources. In some ways, it goes beyond the scope of scientific and technological research itself.

Very often, indeed, to introduce significant changes it is also necessary to **act outside the organisation**, communicating, creating alliances and involving external actors.

This does not mean that the field of action is not wide for every research institution to develop and implement plans for change. However, promoters should analyse all the issues that come into play, understand them and take them into account in the design and in all subsequent implementation phases.

It is not a question, or not only a question, of widening the scope of the analysis, but to identify, each time, the appropriate field to treat a specific aspect of gender inequality. As we shall see later, in some cases it is necessary to refer to the central authorities of the state (for example, to apply for exemptions to existing laws), while in others, negotiations must involve interlocutors within the target institution (such as researcher trade unions), or the establishment of new relations with enterprises or external organisations is necessary, using, where appropriate, the individual social capital of the personnel involved.

2.2. The capacities required of actors promoting change

A second area of lessons learned concerns the capacities needed to cope with the obstacles which arise when change is under way.

Faced with a risk situation and the obstacles described in the previous section, the experimenters showed tenacity and inventiveness, gradually developing **capacities**, both **in terms of understanding and intervention**. The accompanying research showed that these capacities are essential for anyone working towards the goal of altering the gender balance in a scientific organisation.

As mentioned above, the organisations involved often seemed to be opposed, if not openly hostile, to innovation. It should be remembered that in many cases the problems transcend the gender dimension and refer to the more general difficulty of introducing profound and lasting changes in large organisations.

Every activity undertaken, then, was the result of more or less explicit negotiation, which covered not only the ordinary aspects of everyday activities, such as space and time, but also more fundamental issues, such as the existence of forms of discrimination, whether to introduce special measures openly in support of women, or whether to support all women or only the best.

Therefore the category of **negotiation** was deemed useful to describe what happened in experimentations, which can be defined as an activity that involves two or more persons or groups of people who interact to resolve an issue on which there is no agreement. This category can also include, according to an accepted definition in the social sciences, activities which, while not requiring direct discussion, are still aimed at changing the social set-ups in question.

By observing the activities in progress, interacting and discussing with the promoters and, above all, reflecting on their difficulties and their successes, it was possible to understand the centrality of negotiation for the success of their efforts.

Through the double perspective of capacities manifested (or to be developed) and the forms of negotiations that were actually used, it was possible to observe and classify the actions taken by the promoters to overcome the obstacles, taking into account the different contexts, the operational models adopted and the results achieved.

The capacity to interpret and motivate

A first, important capacity that the experimenters demonstrated was the capacity to interpret the origin and the profound dynamics of gender discrimination and, at the same time, motivate and mobilise the different actors in the institution to help remove them.

First, when there was not enough data readily available, action was taken to **access information**, finding ways to overcome restrictive regulations and operational difficulties. Then, updated statistics on horizontal and vertical segregation of women in organisations were produced and disseminated, adopting, wherever possible, a comparative approach. In doing this, a form of interpretive negotiation was implemented, that is one directed at building and disseminating an idea of the discrimination of women in research institutions that highlighted the extent and depth of the problem, avoiding simplistic and minimalist views and uncovering the reality of the stakes involved.

At the same time, the experimenters worked on the internal environment and other factors that affect **motivation for action**. To this end, steps were taken to: systematically collect the views of actual and potential beneficiaries; gradually create internal consensus on content; arouse interest in the issues; prevent the development of hostility towards the actions; promote closer internal relations; increase the visibility of women in the organisation; review the forms and content of internal communication.

These can be seen as forms of **symbolic negotiation**, aimed at disseminating and sharing, through public communication, cognitive structures that have a mobilising effect (symbols) about the value of women's contribution to science.

These actions, which show an increase in interpretive and motivational capacity in the experimenters and a constant exercise of different forms of negotiation, have resulted, in the target institutions and also to a certain extent outside them, in: increased awareness of gender issues among the staff; the emergence of new demands for knowledge; the expression of new needs for training and services; greater transparency; an increase in the visibility of women in the organisation; the identification of new priorities in public agendas; the mobilisation of internal actors beyond the duration of the experimental projects; the emergence of an interest in the actions being undertaken in other research organisations.

The promoters of the WHIST project highlighted some of the effects of the implemented actions. These effects are manifested in different forms in the three institutes, but all have contributed in some way to an increase in the interpretive and motivational capacity of those involved, starting with the direct beneficiaries and including, more generally, the organisational culture and practices of the institution.

A first result was the creation of an **awareness of gender issues** within the organisation. In ESA, for example, there was a general increase in the awareness, to a lesser or greater extent, of gender related problems in the institute. Some facts point to this new tendency. Firstly, greater consideration was given by ESA staff and management to gender and diversity issues, which before were hardly mentioned. Secondly, members of the institutional committee became more aware of the issues which influence the quality of working life in the ESA, particularly as regards women. Thirdly, there was a general increase in the

awareness of the culture of prevention of risk situations. Finally, informal discussion networks were set up at the grass roots level of the organisation. Male and female mentors at the University of Aarhus reported a greater awareness of the problems of young female researchers.

Another specific result was an increased **awareness among project beneficiaries**. For example, the participants in the mentoring programme at the University of Aarhus, became more generally aware of the goals of scientific activity and the unwritten rules of the working environment. This awareness strengthened, in many of them, the determination to pursue a science career at the university.

More in depth the Aarhus University Final report of the experimentations activities reports that: *“The evaluation of the mentoring programme reveals very positive experiences as expressed by both mentees and mentors participating in the programme. During the interviews the mentors praised the idea of mentoring by declaring that through the programme they were able to give young female mentees help to navigate in the research environments and to keep their research careers on track. In addition, the mentors stated that they not only served as professional supervisors, but that they also helped to introduce the mentees to national and international contacts and networks, supported them in applying for research funding, expanding and strengthening their networks etc. The mentoring programme functioned as an instrument for the young female researchers to better understand the customs, norms and cultures within academia. Interviewed mentors stated that during the mentor-mentee sessions they were able to communicate “tacit knowledge” to the young female researchers and to tone down potential frustrations and misunderstandings.*

Also among the young mentees, the mentoring programme is perceived as a success. The statements about the mentoring programme were very positive from the beginning. According to the mentees, the sessions with the mentors did provide valuable skills for dealing with career-related issues. The mentors experience, knowledge and insight were made available to the mentees supporting their career development. Topics of mentoring interest included among others research and publishing, getting grants, professional exposure, teaching, the tenure process and work-life balance. All interviewed mentees stated that the programme was in general very helpful in dealing with the challenges faced by female junior researchers.”

In general, new knowledge was produced and **new demands for knowledge** arose. In IAO a database was produced, and knowledge and experiences were shared even with others outside the project staff. In particular, IAO information, materials and documents about returning to work were harmonised and made more directly accessible to project beneficiaries; new information was acquired on the problems of parents on leave; a storage and collaboration platform was set up on gender diversity and gender equity, begun under “Action 4 - Workshop on gender diversity” by the project staff. In ESA, the internal circulation of statistics on the gender gap produced, among other positive outcomes, an increased number of requests for such data from different departments of the institute.

In addition, the project beneficiaries were able to identify new needs. In IAO, for example, the beneficiaries of Action 3 “Re-entry process after baby break” requested new communication tools for parents on leave, which was identified as a critical aspect for continuity in the working life of staff in the institute. In ESA, cognitive effects included managers being able to identify new staff training needs, as a result of an awareness of issues regarding standards of conduct to help remove obstacles encountered by women in their careers.

A **greater focus on work-life relations** in scientific organisations was also noted. The IAO, for example, became aware of the need to reconcile work/life both among women and men. This is demonstrated by the fact that the main users of the specifically created intranet page on gender are staff members with families, who tend to see this page mainly as a tool to help establish work-life balance. Also additional family services were introduced and actions to support the re-entry of parents were launched. In addition, in ESA, those most at risk (such as contractors, whose employment in the agency is temporary, and who consist mainly of young men and women) have shown a greater interest in issues related to working life. In Aarhus, some researchers who were consulted about drop out rates at the university made proposals to help reconcile young scientists with their young children, such as the activation of family-friendly services, the provision of better job opportunities for those requesting part-time, the planning of re-entries in the first six months; the chance for those with small children to have a greater number of hours of assistance for administrative tasks or help from students.

Another effect produced by the experimentations was a **general increase in transparency**. According to the project team, the publication of genderised data on the ESA intranet facilitated an overall increase of

transparency in the agency. This would appear to be confirmed by the creation of a forum for dialogue on issues previously avoided, thanks to the opportunities for discussion provided by the guidelines. Aarhus has also seen increased transparency, with the activation of a monitoring system that continually highlights the gender gap in the university (making it possible to take concrete actions to address issues found).

As reported in the Fraunhofer Experimental initiative final report : *“An important activity undertaken as part of the experimentation in IAO was to take systematic inventory of the issues concerning equal opportunities that were already on the Fraunhofer Intranet, and which could serve as a model for the IAO Intranet. The topic “equal opportunities” is presented quite comprehensively on the Fraunhofer-Intranet. However it appears somehow confusing as it is a little bit unstructured. There is some information which is only interesting for the woman in charge for equal opportunities (BfCs) of the Fraunhofer Institutes and not for the employees, like the list of appointments for the BfCs and information for the BfCs about their meetings. Moreover, a lot of the information is out dated and obsolete. For some topics, information can be found in different categories. For example the topic child care is found in three subcategories of the category “Job and Family”. Information about the Girls’ Day are not only in the subcategory “Girls and technology: Girls’ Day at Fraunhofer”, but also in the sub-category “Activities and projects”. Furthermore, some sub-categories have the same name, for example there are sub-categories called “tools” in category 1 “Players for equal opportunities” and in category 3 “Job and family”. This is confusing for the user because the overview of the navigation can easily be lost.*

Another outcome was **new initiatives**. A direct result of the availability of genderised statistical data on the intranet was a bilateral ESA/EC meeting on the subject, organised by the ESA representative at the European Commission. Then new priorities were put on the agenda: for example, the ESA institutional committee for the promotion of quality of life prepared a paper for ESA’s Agenda 2015.

Another effect of the experimentation on organisational culture was the adoption of **new approaches and perspectives**. In IAO, in particular, a new and broader perspective on gender and diversity has gained ground, also helped by the scientific and non administrative background of the new head of the equal opportunities. In ESA, as an indirect effect of the increased visibility of gender issues in the agency, the Communications Department (despite some opposition to the experimentation) introduced more initiatives involving women, thus setting a new course. Furthermore, in relation to the production of guidelines on behaviour, an early warning culture to prevent unacceptable behaviour seems to be taking root.

Other consequences of the actions taken include **new communication and interpersonal dynamics** in all three institutes. In ESA, for example, the emergence of new alliances between different departments for a human resources policy to change the work culture and the creation of new inclusive partnerships between key actors and institute management have been observed.

As regards consensus, specifically, there has been an increase in the visibility of women and gender issues in scientific research organisations. In the case of ESA, there was positive feedback on various aspects of the communication campaign on gender issues (see box). Then, in the case of AU, female role models were appreciated: some beneficiaries reacted positively to female mentorship, a role model for which they felt the need. Again in AU, the beneficiaries of mentoring programmes developed greater self-esteem, and there was a general appreciation for these programmes.

As specified in the ESA final descriptive report : *“as part of a communication campaign carried out at ESA, “a new series called “Women at ESA” was launched in March 2010 at the symbolic date of the 8 March. Four different women who are role models of career success in the Scientific and Technical field were published on the HR intranet and also on the ESA intranet. All staff have also received the news as an e-newsletter” (...).*

The women interviewed “had to be convinced to participate as their feared too much exposure and also with the wish to be treated as any other staff and they did not want to be marginalised for being women and simply be praised for their professional success.

Staff feedbacks on the initiative have been extremely positive and successful as they felt it was the first time women were asked the right questions regarding their perspectives of career evolution and the difficulties they meet in their daily work life.”

An interesting outcome, in terms of motivation, is the great commitment shown by the actors, even beyond what was expected. For example, at IAO, the equal opportunity manager was directly involved in making

sure the actions were sustainable beyond the duration of the WHIST project, and in AU mentors and mentees decided to continue the mentoring programme beyond the experimentation period. In AU, the mentors made a positive assessment of their voluntary participation, although, according to some, the institute could have recognised the importance of the programme and their commitment in terms of time by awarding a financial contribution.

In general, as well as numerous positive results within the institutes, there were also some external successes, such as arousing the interest of other parties. The experimental initiative carried out in the IAO, and, in particular, the collection of data and information for the preparation of a gender report aroused the curiosity and interest of the IAT administration (University of Stuttgart). This interest, as stated by the parties concerned, represents an important first step in the realisation of further joint activities in the field of gender equality, which, while they are perceived as necessary for the two organisations that work side by side, they cannot be considered as an automatic result of collaboration between organisations that are legally distinct in all respects.

There was also great media interest in the gender issue at the university. In Aarhus, a public debate was initiated on the existence of gender discrimination at the university in general and against women in academia in Denmark, which involved the media and women in public life.

The capacity to bring about institutional and operational change

In addition to interpretive and motivational capacity, the experimenters also worked on boosting institutional and operational capacity, developing negotiation skills to implement changes in rules, organisational operations, and day to day behaviour.

As mentioned above, during the experimentation it was necessary to carry out **negotiations**, both inside and outside the target institutions. In some cases, negotiation with the outside was at a high institutional level, also involving the government of the country. As regards the institutional situation within the target organisation, **new ways of using existing tools** were proposed (for example, the preparation of periodic reports on equal opportunities), or **new forms of institutional communication** were implemented (such as inter-institutional committees).

These two types of action, albeit different in scale, may both be considered as forms of institutional negotiation, having the goal of changing the rules of the game that tend to reproduce the status quo causing discrimination against women in organisations.

To be effective, then, the three experiments had to implement interventions that could impact the material and environmental reality of the target organisations, working to ensure that the agreed initiatives were actually carried out. To this end, it was essential to collaborate with the administrative staff, a key actor in getting things moving and unblocking situations.

To facilitate the implementation of planned initiatives, constant efforts were made to **include and involve more interlocutors** in the implementation and monitoring of new activities, starting from the operational sectors of the institution and then going on to the associations of employees and also external parties, such as HR managers of similar organisations.

In many cases it was necessary to **rethink and redesign** some of the activities during implementation to take account of occurred changes.

All these examples can be seen as forms of operational negotiation. This activity concerns the realm of material power and involves getting things moving, changing attitudes, behaviours, and procedures to make concrete improvements to the position of women in organisations.

The results of experiments on institutional and operational capacities included: an increase in the competences of the beneficiaries; the establishment of new relations between departments of the same institution; the triggering of new internal communication dynamics; the confirmation or reissue of the experimental programmes; the introduction of new measures and procedures; a review of internal policies; the design of new initiatives and new *modus operandi*.

In their final evaluations, the WHIST experimentation promoters pointed out a number of **results** that could be indicative of improved institutional and operational capacity. First, the effects reported by the people who benefited from the programmes will be illustrated, and then the changes that affected the whole organisation.

Regarding the direct beneficiaries, a series of outcomes should be highlighted, some of which were mentioned by the beneficiaries themselves. As regards the evaluation of the mentoring programme at the University of Aarhus, the mentees said:

- They received short and medium term career planning information;
- They were included in quality professional networks or their networking capacity was strengthened;
- They became more aware of the actual working conditions in the university, which enabled them to manage their effects;
- They noted an increase in their personal capacity and professional skills;
- They became more acquainted with the research environment;
- They received advice on balancing work and family life and became more competent in this regard.

Here some final comments from the beneficiaries of the mentoring programme at Aarhus;

"It is due to programmes like this that you feel confident about yourself - that you start to believe that you can navigate within academia. And you start believing that it's possible to get an academic career".

"I definitely believe that this mentoring programme has helped raise my independence and given me some totally different perspectives on career choices."

"I believe it has been good for me insofar that it has helped me develop a little bit of a "give 'em hell"-attitude and I believe a bit more in myself. Sometimes when I think: "No, I do not want to do this", I think about my mentor, who says, "pull yourself together and get it done".

"I can feel the effect right away after every meeting with my mentor – I get a kind of support and an endorsement that enables me to put any anxieties behind me. Our conversations simply eliminate possible insecurities and it helps me become more dedicated."

The positive effects of the actions undertaken involved **other actors** within the research institutes that promoted the experimentation. For example, new relations were created between departments within the same institution and new communicative dynamics were triggered in the organisation. In particular, a "bottom-up" institutional communication process was activated in the IAO involving staff at different levels. In ESA new alliances were made between departments.

Perhaps the most evident result in institutional and operational terms of the experimentation in the three institutions was the continuation, confirmation or replication of some of the programmes implemented on an experimental basis.

In particular, the University of Aarhus decided to continue mentoring activities and extend them to all faculties and possibly also to young male researchers. ESA decided to continue all the actions undertaken. Finally, the Fraunhofer presidency decided to replicate the baby welcome package initiative on a larger scale.

The positive effects of the experimentation on the institutional dynamics of the organisations include the launch of new policies and procedures - some of which were introduced during the experimentation.

At Aarhus the request made by the Human Resources Task Force to make an exception to the national law has been accepted by the Ministry of Science and allowed the hiring of 20 new women professors and associate professors making it possible to implement an important measure for gender balance in teaching staff. The application was approved by the Ministry in July 2010. The university management decided to implement the action as of February 2011. Also the university management decided the procedure as follows:

".. it must be new positions as associate professor and professor with special responsibilities, and the positions must be advertised in public. The procedure for assessment of candidates is the same as with all other scientific positions at the university. The central HR department is coordinator and monitor of the action. However, the recruitment itself is delegated to the faculties offices. The faculties/schools are in charge of the recruitment process, and as mentioned before the procedure does not deviate in any way from the usual procedure for recruitment of scientific personnel - including public advertisement and assessment committees."

The number of new professors for each faculty has been decided by the actual size of the faculties. (...) The operation will run as long as there are positions allocated for the four faculties/schools that have not been filled with a female applicant."

In IAO, the Governing Council (ILA) agreed to introduce an item on equal opportunities in the standard monthly meeting agendas.

As regards acceptable behaviour guidelines, in ESA a review of current policies for the prevention of harassment is currently being carried out.

As specified in the ESA final descriptive report on experimentations ESA: *"The guidelines do integrate a strong statement from the Director General and give instructions and practical advices for staff when facing critical situations, with a particular focus on preventing from the roots gender discrimination and harassment in the workplace. The guidelines contains also:*

- *A section explaining why the guide has been developed;*
- *A section describing what is expected from each individual working for ESA;*
- *The 4 principles at ESA;*
- *Best practices and examples of misbehaviour;*
- *A section highlighting top and middle management commitment in monitoring progress made and improving the quality of the working environment with a particular stress on women.*

The experimentation also provided an opportunity to design new initiatives and to adopt new modus operandi.

For example, ESA managers took important operational decisions during the experimentation, such as:

- punishing behaviours deemed unacceptable;
- using the guidelines on acceptable behaviour to assess management capacity to handle diversity in the workforce;
- developing ESA "champions", using the guidelines on acceptable behaviour, to represent the agency in fields relating to gender and diversity;
- promoting the use of mediation as a key tool to support staff and contractors at all stages of conflict prevention and management (as concerns both harassment and interpersonal relations in general);
- launching a new programme of activities starting with the institutional committee workshop on the management of diversity in all European offices, setting up a series of training activities (19 seminars to be held in the different ESA offices all around Europe) on the topic of gender and diversity.

In Aarhus, as a result of the mentoring programme, new interdisciplinary studies involving the departments of mentors and mentees were also started.

Last but not least, mention should be made of some effects produced by the experimentation on external relations and joint initiatives with other similar organisations or partners. These included IAO discussions with IAT (Institute for Human Factors and Technology Management Stuttgart University) on the management of personnel. This dialogue also involved consultation on initiatives aimed at gender equality and the gradual dissemination of information on initiatives of this type (with WHIST and otherwise), both in IAO and other Fraunhofer institutes. This led to the adoption of the gender perspective and the start of negotiations to activate new initiatives in other institutes .

The capacity to trigger social innovation processes

Finally, the experimentations and the accompanying research were able to see a third capacity at work, as yet still underdeveloped during the WHIST project, based on the deployment of all capacities and, therefore, employing the different forms of negotiation described above. This capacity could be termed **social innovation**.

It involves making the gender equality reforms that have been implemented within research institutes produce an irreversible change in the institutions themselves, so that they become a common heritage and an integral part of both the scientific and technological research system, and the social culture of the region. At the end of the next section we will discuss some of the conditions required to activate this broader and more complex capacity.

The arena of the fight against gender discrimination in research is vast. In fact, WHIST findings showed that many obstacles faced by the promoters (and the solutions) are not unique to gender issues in the strict sense but to science and technology in general, in their relationship with society. In addition, while several issues that emerged in the experimentation can be addressed by interventions within individual organisations, many others, perhaps most, can only be solved by actions on a larger scale, involving various types of public, private, and non-profit actors, at local, national and even trans-national level.

This means that if we really want to change the condition of researchers (at local level or in specific institutions), not only do we need to effect real change in individual research organisations but we also need to have the courage to **think big and think for everyone**. This means trying to produce structural, profound and somewhat irreversible effects, which to a certain extent are in the world of science and technology and in the relationship between science and society as a whole. In essence, we must endeavour to promote social innovation, in collaboration with all actors concerned with these issues.

This is a third type of capacity, which leaders (at all levels) committed to gender equality in research must be able to effectively develop and implement. In addition to the capacity to interpret reality and motivate the actors, and the capacity to change the rules of the game and the actual functioning of organisations, it is necessary to develop a specific capacity for social innovation.

Without going into the broad debate on the notion of social innovation, in this particular case we refer to the capacity to negotiate and promote, as far as possible and within different contexts, radical and lasting changes in the relationship between science, technology and society, which can impact the condition of female researchers.

Of course, it is a capacity that may have different degrees of intensity and different forms of application, but it must still have at least one essential feature: the **adoption of a strategic perspective** that is broader than the one required to operate in a single organisation, where only specific issues are concerned and a relatively small number of interlocutors are involved.

This should be done in the knowledge that a quantitative and qualitative improvement in the situation of women in research will contribute to the expertise, intelligence, sensitivity, and vision required for the development of science and technology, creating a closer link between science and society, critical to human, social and economic growth.

On the basis of the WHIST findings, we can say that this particular capacity for social innovation must meet certain requirements:

- Action against the discrimination of women in scientific research should be linked to collective action and movements through which women have over time produced important public policies and general social change;
- Political and cultural institutions must be involved, at every level – local and (if necessary) national – in the elaboration and implementation of policies to support women in scientific research;
- The media should be used to raise awareness among the general public of the crucial importance of science and technology and its organisational structure in contemporary society, of the gender issues in the world of research and the interventions undertaken, or that can be undertaken in this field;
- Citizens should be encouraged to participate (locally and in Internet networks) in the management of the current problems of science and technology, and specifically gender issues in research.

All this calls for actors promoting gender equality-oriented interventions in research to acquire a new kind of political savvy, in the sense of a moral and behavioural attitude that stimulates and follows up actions to promote social innovation in this field.

3) THE GUIDELINES ON GENDER DIVERSITY IN S&T ORGANISATIONS

The main output of the project as a whole is represented by the “Guidelines on Gender diversity in S&T Organisation” presented on 7 November 2011 at the final conference of the project which has been held in Brussels.

The guidelines aim at capitalising the outcomes of both the experimentations and the Supporting Action as a whole in order to facilitate the design and development of future actions. They are part of a wider policy of structural change, launched by the European Commission after the first ten years of activities on gender and science.

The guidelines provide operational guidance for gender equality actions in research organisations, as they emerged from the implementation and analysis of three pilot experimentations, coordinated each other. The project has enabled the team of the three concerned institutions, on the one side, to develop a set of capacities needed for the transformation of existing organisational arrangements and, on the other side, to observe such capacities in action through the accompanying research.

The guidelines are primarily addressed to the leaders of the scientific research bodies and public and private universities, as well as groups and associations of women within the institutions themselves, in order to provide them ideas and suggestions to implement or enhance initiatives aimed at gender equality in their organisations. More generally, the guidelines are also addressed to public, private and non-profit organizations involved in policy research and in equal opportunities policies, as well as to civil society organizations, business associations and trade unions, scientific associations and networks of national and European media.

The table here below summarises the recommendations contained in the guidelines.

SUMMARY TABLE N. 2 RECOMMENDATIONS

INTERPRETIVE AND MOTIVATIONAL DIMENSION	
Area: demystification	
R1.	Collect and disseminate gender statistics
R2.	Conduct an analysis of gender inequalities within the organisation
R3.	Identify and formalise the intangible and hidden aspects of discrimination
R4.	Adopt a comparative approach to understand gender differences in the organisation
R5.	Highlight the link between gender equality and economic development/competitiveness/innovation
R6.	Highlight the link between gender issues management and life/work quality
Area: shared and consensual vision	
R7.	Adopt a diversity approach that does not lose sight of the gender dimension
R8.	Promote dialogue between women and men
R9.	Create an awareness of gender issues among different types of actors
R10.	Collect the views of potential beneficiaries
R11.	Include gender issues as part of a broader public debate
R12.	Promote specific information on the relevance of gender to science, technology and engineering
R13.	Interpretation of gender issues and possible solutions supported by prestigious figures within the organisation
R14.	Exploit existing tools, traditions and sensibilities in the institute or local area
R15.	Set internal guidelines
Area: the relevance and plurality of communication	
R16.	Conduct ad hoc information and communication campaigns within the organisation
R17.	Pre-testing of communication initiatives
R18.	Exploit existing institutional communication mechanisms
Area: valorisation of competencies	
R19.	Identify and activate people with specific competencies on gender issues
R20.	Set up teams which include researchers that have different competencies and are from different scientific areas
R21.	Include motivated women in planning and monitoring groups
R22.	Allocate resources to researchers involved operationally in gender equality programmes
Area: observing and monitoring	
R23.	Create a network of responsibilities
R24.	Create permanent observatories
R25.	Manage and share information
INSTITUTIONAL AND OPERATIONAL DIMENSION	

Area: rules and regulations	
R26.	Take advantage of favourable national legislative frameworks
R27.	Results should be incorporated in new guidelines and regulations
R28.	Establish mandatory gender quotas in staff selection and promotion committees
Area: involvement of institutional leadership	
R29.	Facilitate the direct involvement of the organisation's managers and other key players
R30.	Ensure technical and political support to the administrative staff involved in gender programmes
R31.	Involve decision-makers in working groups
Area: production of benefits for all	
R32.	Facilitate access to external funding
R33.	Promote the participation of men in committees and working groups for the promotion of gender equality programmes
R34.	Consider the needs of beneficiaries from a "holistic" perspective
R35.	Implement visible and measurable arrangements to support the working life
Area: political relations and external synergies	
R36.	Negotiate strategies and programmes with government agencies
R37.	Get the support of regional and local governments in promoting gender equality policies
R38.	Create synergies with advocates and partners at the local level
R39.	Foster a sense of ownership in partnership programmes
R40.	Highlight how relations with the business world can be mutually beneficial
R41.	Promote participation in research organisation networks
R42.	Activate exchange strategies with institutions and programmes that have similar goals
R43.	Use the social capital of key people to solve problems
Area: planning and coordination	
R44.	Clearly define the organisational structures responsible for equality
R45.	Personalised programming of interventions
R46.	Promote "cohort" planning to help groups and networks
R47.	Promote "multi-level" design
R48.	Adopt effective monitoring systems
R49.	Creation of new legal entities for the implementation of programmes
R50.	Select target beneficiaries that are homogeneous in terms of career paths
R51.	Ensure the cultural matching of programme operators and beneficiaries
R52.	Establish committees of experts to supervise and follow up the programmes
R53.	Involve researchers from different disciplines in the programmes
R54.	Prevent problems in accessing data related to privacy
R55.	Choose the right moment to propose the identification and discussion of gender issues
R56.	Facilitate networking within the organisation
R57.	Promote and streamline the exchange of ideas and decisions concerning equality inside the organisation
R58.	Adopt mixed and flexible approaches to implement support programmes
R59.	Avoid "conflicts of interest"
R60.	Have a clear idea of the goals of the actions
R61.	Calculate accurately the time needed for negotiation activities

Potential impact and main dissemination activities and exploitation of results

1. General overview

The expected impact of the WHIST project, according to the work programme Science in society in relation to the topic “**SiS-2008-2.1.1.1. Gender management in research organisations**”, was the following: “contribute to changing the attitudes of the targeted audiences with regard to gender diversity in research organisations, and foster change – in particular in terms of increasing the participation of women at the highest levels of research, as well as in the methods used for recruitment and retention of research personnel, both men and women. Methodologies to implement the above mentioned strategies should be proposed. The participation of high level actors is required in order to ensure lasting impact.”

The WHIST project contributed to the above-mentioned impact achievement at different levels.

- It facilitated the ignition of **real change in gender management**, supporting the launch and implementation of experimental activities in universities and institutes already active in this field, namely ESA, Fraunhofer IAO and the University of Aarhus, and thus producing permanent impacts on the participation of women at the highest levels of research, as well as on the methods used for recruitment and retention of research personnel in the three European research organisations involved in the experimentation (all of which are of considerable size) (see WP 4, 5 and 6);
- The project contributed to the **change of attitudes** with regard to gender diversity in research organisations in further European research organisations which, although not directly involved in the experimentations, have been in any case directly involved into the project through the interactive workshops on gender diversity management and the final conference (cfr WP3, WP8);
- It **developed and tested**, through the experimentations, **methodologies** allowing to actually implement the strategies in support to women’s leadership and the recruitment and retention of research personnel (see WP4, WP5 and WP6);
- At the same time, through the joint process of experimentation and research leading to the final version of the guidelines (WP2), the project **increased the degree of knowledge** on the most effective instruments and solutions for tackling the various obstacles to the presence of women in scientific research;
- Indirectly it contributed, through the dissemination of the final version of the guidelines, the international conference and the other public communication activities (WP 8 and 9), in inducing changes in gender management, with respect to the presence of women at the research top levels, the recruitment and retention of research personnel in further European research organisations and the promotion of gender equality in research;
- The WHIST project also facilitated the **integration of the gender dimension throughout European Research** through all its activities (and the impacts mentioned so far) and particularly through the production of the guidelines (WP2), the international conference (WP8) and the public communication activities (WP9);
- It facilitated (through the same activities) **awareness-raising processes** within the scientific community, in the general public and among policy makers about gender and research;
- Finally, albeit within the limited domain of S&T and, more specifically, within the European Research Area, the project contributed to the **implementation of the EC strategy** on gender equality.

It must be stressed that the direct impact of the project undoubtedly has a cognitive character (thanks to the guidelines, the interactive seminars, the international conference and public communication), but also a strictly operational character (thanks to the experimentations). However, the project has likely already had further indirect impacts on gender management (and thus on both the participation of women at the highest levels of research and the methods used for recruitment and retention of research personnel), since the project products (guidelines, public communication, etc.) enabled transferring the lesson learned drawn out of the experimentations to other European research organisations and, more generally, to the European Research Area as a whole.

Moreover, the implementation of WHIST produced an increase in institutional capacity building and a better awareness on the themes that it addressed, at the level of the Member States (the leadership of the

Department of Equal Opportunities of the Italian Government – a “high level actor” able to devise policies at both national and European level – facilitated the attainment of this result and the actual achievement of the aforesaid impacts.

Finally, some of the activities carried out (above all, those under WP2, the international conference under WP8 and the public communication under WP9) increased the level of knowledge on discriminatory dynamics as well as on positive actions against vertical segregation in various professional and institutional domains connected to S&T.

In general terms, the implementation of WHIST can be seen as part of the European efforts aimed at establishing a sort of “regime” (or control mechanism) to reduce two main risks:

- the weakening or inefficiency of the effects produced by measures adopted at European level to strengthen scientific and technological research systems;
- a continuous waste of qualified and trained female human resources which undermines all the efforts at creating that “European space” of research capable of competing world wide.

Furthermore, the efforts made through the project in promoting a full integration of gender dimension in the scientific arena (with all its positive implications on the development of science as a whole) have likely had some impacts in the direction of the intensification and improvement of the dialogue between science and society.

In order to maximise the results of projects and studies already carried out and to favour an actual accumulation of knowledge (in theoretical, methodological and operational terms) in relation to which the project sets out to make progress, it appeared essential to insert the first task of the WP2 “Review of the literature and documentation” at the start of the project, focused on the gathering of further information (in addition to those contained in the initial project proposal) on the main risk areas for gender diversity in research organisations and on the relative “regimes”.

In order for the project to effectively contribute in achieving the impacts defined by the European Union on this topic (which are mentioned above), WP8 and WP9 were also relevant in that they included the organisation of a conference at European level and a number of activities for communication, dissemination and exploitation of the results.

2. The impact in the institutions directly involved in WHIST

The criterion of the impact was included in the second work-in-progress general internal evaluation of the whole WHIST project, which has been conducted before its conclusion in October 2011. Several indicators were used to measure the **objective impact**, referring to the effects produced by the project in terms of actual changes, and the **subjective impact**, concerning consensus and satisfaction of the beneficiaries about the various activities of the project work packages.

The evaluation process was conceived as mainly dedicated to the implementation of the experimental initiatives, which at that time (October 2001) were anyway still going on in some aspects. For this reason, the criterion of impact, while was fully applicable for evaluating the **subjective impact**, was not equally meaningful in the case of the **objective impact**. Information in this regards were anyhow gathered, taking into consideration the ongoing effects of the three experimental initiatives.

Even taking into consideration these limitations, the project partners have considered as **rather positive the project impacts**.

The **objective impact** has been detected on the basis of the effects of the project activities. Such effects have been described in detail in “Main S&T Results and Foreground”, as they were reported in the final reports of the experimental activities and in the “Guidelines on gender diversity in S&T organisations”. Hereinafter, thus, they will be just quickly recalled, as they were reported by the WHIST partners in the aforesaid evaluation. To this end, the following positive effects involving the concerned organisations have been mentioned:

- introduction of organisational, normative or procedural **changes aiming at facilitating women’s access to leadership** (referred by the University of Aarhus, ESA, and the University of Milan);

- introduction of **changes within working programmes, policies or procedures** (quoted by the University of Aarhus, ESA, and the University of Milan);
- activation of **new programmes, actions, policies** (reported by the University of Aarhus, ESA, and the University of Milan and ASDO);
- adoption or **use of some experimentation outcomes in other sectors/areas/departments of their organisation** (pointed out by University of Aarhus, ESA, and the University of Milan).

As for the **unexpected effects** of the project implementation inside their research bodies, the partners mainly mentioned positive impacts such as:

- **high level of the staff participation** of the whole organisation (mentioned by ESA);
- implementation by the University of Aarhus of **new actions initiated by the Task Force on Gender Equality** with the target to (i) increase the numbers of female professors and (ii) study the reason why young researchers leave the University.

As for the negative effects, it has only to be reminded the remark of Fraunhofer IAO and AU concerning the pace of change, which revealed to be slower than expected.

Another indicator of objective impact is the **level of dissemination of information** about WHIST and its experimental activities (this latter as been asked only to the three partners coordinators of experimental activities). Each partner was asked to **rate the level of dissemination of information** inside and outside their organisation, ranging from 1 and 5. The average of the scores expressed was high enough (4,43).

The partners coordinators of experimental activities were also requested to rate from 1 to 5 the **satisfaction** and the **agreement of various actors** (direct beneficiaries, members of the support committee, staff of the experimental activity, managers/leaders of the organisation, persons in charge of internal programmes/activities such as equal opportunities, male component of the staff) towards the actions carried out. The average score was 4,67 for the satisfaction and 4,42 for the agreement. All in all, according to the collected information, the objective impact appeared **positive**.

As for the **subjective impact**, the **degree of satisfaction** of the partners on some aspects of the project (such as the work programme, the work of their own team, the assistance received from the coordinator and the WP/Task leaders, the scientific quality of the project outputs, the collaboration of other partners) and the WHIST outcomes (plan and implementation of the experimental activities, plan and implementation of the accompanying research, plan and implementation of the joint experimentation support programme, communication) was used as an indicator of subjective impact. A scale was applied, ranging from 1 (low) to 5 (high). The **average level of satisfaction** of the partners was **high** as for the appreciation expressed on some aspects of the project (4,63) and the WHIST outcomes (4,64). Also the **average satisfaction of each partner** appeared to be rather **high**, ranging from 4 to 5 in all the proposed items.

Moving on from the actual to the potential impact, the **main indicator of a potential impact** of the WHIST project in the partner organisations after its conclusion, anyway, is the **decision to follow on the way traced by the experimental activities in their midst and to start on the same path also in another body involved, the University of Milan**. Fraunhofer IAO, the University of Aarhus and the University of Milan, indeed, will be involved in a structural change project named STAGES (see below), which follow similar strategies developed in the WHIST project. ESA will keep on the way through the programme “Life at ESA”, which also builds on the results of WHIST project inside the organisation. As for the coordinator DPO and ASDO, the WHIST partner in charge for the technical assistance and accompanying research, they will keep and enhance their role in the STAGES project.

3. The external impact

The internal evaluation carried out in October 2011 also revealed some positive effects already produced by the WHIST project, namely the adoption or use, as referred by the University of Milan, of some outcomes of the experimentations in other S&T organisations, starting from the same University.

It is worth mentioning some further unintended positive effects already occurred, also affecting the external environment of the WHIST project, such as:

- the signature (by the Italian Government) of a **Memorandum of Understanding between Italian ministers for Equal Opportunities and Research** geared at concrete actions against gender gap in sciences in Italy and at European level (DPO, ASDO);
- the **presentation of the WHIST project** at the **United Nations**, in the framework of two parallel high-level round tables the CSW No 55. (ASDO);
- the **financing by the EC** under the FP7 SiS 2011 through the project proposal **STAGES of new action plans for gender equality** in a context of structural change, prepared by 5 out of 6 WHIST partners and by the same people involved in the project (DPO, ASDO).

The facts mentioned above, as well as other events occurred in the final phase and after the completion of the WHIST project, let us suppose that the WHIST results will contribute to a further development of gender and diversity policies in European science. The following examples can be mentioned:

- the will expressed by some speakers and participants in the final conference of the WHIST project to **apply the final guidelines in order to design further actions** (e.g. the head of the FP7 project FESTA, the representative of the EC Unit Gender and Ethics, a representative of LERU);
- the decision of the Italian Head of the Department for Equal Opportunities to **prepare another project proposal aimed at structural change** in European research organisations, to be funded under FP7 2012 and co-funded by the Italian government;
- the invitation addressed to representatives of the consortium to **present the European experiences on women in science** (mainly based on PRAGES and WHIST) **in some Universities in USA and Canada**.

4. Main dissemination activities

The dissemination activities have been mainly performed within the WP9 implemented by the Department for Equal Opportunities in collaboration with all the partners of the Consortium. The aim of the WP was that of disseminating the project products and circulating information on the project activities, thereby involving a broader audience in the project implementation than just the beneficiaries and consortium members.

All the opportunities emerged from the activities of the other work packages were also seized to spread the word about the project and its results in contexts relevant to the WHIST aims and activities. Particular attention has been paid to assuring dialogue between public scientific research institutions, on the one side, and private firms and multinational companies, on the other side, on the issue of gender management. In order to diversify the targets, a communication model specifically designed for scientific communication was adopted, identifying the following different “audiences”:

- Social scientists specialised in feminist studies of science and S&T studies (specialised research communities level);
- Scientists and engineers (faculty/department level)
- Scientists and administrations dealing with research activities in terms of planning, management, communication, evaluation, etc. (universities/research institutes leadership level);
- Professional associations, women’s scientists networks and civil society groups interested in S&T related issues (social level);
- Representatives of the political community (political parties, public administrations, institutions) dealing with science or equal opportunity policies (political level);
- Public opinion and scientific journalists (general level).

The dissemination tools have been the following:

- A mailing list was set up which include over 4,000 contacts all around the world.
- A web site was created containing sections on the project, the activities underway, the significant documentation and studies, the consortium members and the other organisations involved in the experimentations. The web site has been visited by over 9,000 contacts per months.

- In connection with the website, an e-newsletter (4 issues) has been produced, which has been sent to the aforementioned mailing list that reached 4,000 entities by the end of the project (mainly but not exclusively in the countries of the consortium members and organisations and institutions at European level).
- In connection with the public communication aims, two policy briefs illustrating the project and the expected results have been drafted and disseminated.
- 3 national seminars were organised in the European countries represented in the consortium to discuss the experimental activities with researchers and professionals involved (WP3).
- A final conference (WP8) was organised in Brussels on 7 November 2011. The conference was attended by overall 100 people, including European and non-European academics and decision-makers. The main objective of the conference was to favour high level dialogue among experts, policymakers and directors of public and private scientific institutions in order to promote a positive attitude towards gender diversity and towards women's presence at high levels of scientific research. In addition, it also represented a point of international discussion of the results of the support action in the perspective of the new "Horizon 2020".
- The WHIST team participated in several Conferences and meetings on gender in science all around Europe and outside (see below). Account has been taken of the other national and international research initiatives currently in progress, with special attention to the European policies in this domain. WHIST took as far as possible into account other national and international research and support activities on gender management in S&T organisations and related issues. All the research institutions involved in these initiatives/projects have been included in the target of the Brussels international conference (WP8) and in communication activities (WP9). The WHIST partners participated in open conferences/seminars promoted by these initiatives/projects and by the European Commission (see 4.2.).

5. Exploitation of results: Dissemination of the "Guidelines on Gender Diversity in S&T Organizations"

The guidelines in their final version are being disseminated, with the help of all the partners, to the following beneficiaries:

- Public, private and non-profit institutions in charge of research policies;
- Public, private and non-profit institutions involved in equal opportunities policies;
- Managers and other representatives of national research institutions (universities, research centres in enterprises, research centres in public administrations, research centres linked to civil society organisations and its networks, other research centres);
- Heads of civil society organizations;
- Members of European institutions (such as the European Institute for Gender Equality – Vilnius – Lithuania and the European Research Council) and European thematic relevant groups as the Helsinki Group;
- Members of national and European business and trade-union associations;
- Members of national and European scientific societies and networks;
- Representatives of the world of information with particular, but not exclusive, reference to those involved in gender issues and those specialised in the popularisation of science;
- National bodies for finance and promotion of research (such as the Belgian FNRS, the French CNRS, the Italian CNR, the British CST or the Finnish Science and Technology Policy Council, etc.);
- Members of international organisations (such as UNWomen, the World Bank etc.);
- The main traditional and online media specialised in scientific and technological research or in gender issues.

With regards to networks, dissemination activities are also addressed to at least the following ones:

- European and national networks specifically engaged in the issue of women in scientific research and, in particular in the application of the principle of gender integration in FP7, such as, for example, the European Platform of Women Scientists (EPWS, www.epws.org);

- European networks and associations of academics and actors in scientific research, such as the European Association for the Study of Science and Technology (EASST, www.easst.net), the European Association of Science Editors (EASE, www.ease.org.uk), EuroScience (the European Association for the Promotion of Science and Technology, www.euroscience.org), the European Science Foundation (ESF, www.esf.org); the European Association of Research Managers and Administrators (EARMA, www.earma.org); European University Association (EUA www.eua.be); the League of European Research Universities (LERU www.leru.org); the European Heads of Research Councils (EUROHORCS, www.eurohorcs.org);
- European and national networks and associations focussed on the gender themes (such as, for example, the associations on women in science acting in nearly all the European countries and the European Association for Gender Research, Education and Documentation ATGender, www.atgender.eu);
- International networks focussed on the gender themes (such as, for example, the Huairou Commission, www.huairou.org/);
- World-wide network of women inventors and innovators, with a focus on Euwiin (European Union Women Inventors & Innovators Network, www.euwiin.eu).

6. Knowledge management and intellectual property

The management of the knowledge produced through the project activities has been carried out mainly using of the project web-page, the newsletter and the communication activities among the project partners. In particular, through the web-page the public deliverables of the project have been published and, thus, made available to the scientific community and all other concerned actors.

As for intellectual property, the publication of the deliverables follows the rules provided by EU, according the principle that the deliverables not restricted to the consortium are to be disseminated and made available for free.