

European Science Foundation Exploratory Workshop  
ESF/ LESC-SCSS Exploratory Workshop

Report of the Exploratory Workshop

**“The Reuse of contaminated sites  
for local sustainable development strategies”**

Isola San Servolo, Venice (Italy), 26-28 May 2008

**Convened by:  
Margherita Turvani**

Department of Planning, University IUAV of Venice  
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## **Executive summary**

Contaminated sites are defined as those sites which pose a significant risk to human health and the environment (EU Soil Thematic Strategy, p. 10). An intervention aimed at re-qualifying and subsequently reclaiming these areas has a far-reaching impact that is difficult to quantify, and produces positive effects on human health, economic development, and the distribution of risk and of environmental responsibility.

In the context of urban development policies, derelict areas are important for implementing urban renewal and re-qualification, especially in the framework of environmental safeguarding, human health and sustainable development.

The ESF exploratory workshop on “The Reuse of contaminated sites for local sustainable development strategies” offered the occasion to put thirty people together, with different institutional responsibilities, various research and disciplinary interests, from various public agencies and academic institutions, coming from 11 different countries, in Europe, USA and China, all involved and actively dealing with the variety of issues and demands posed by the challenges related to contaminated sites remediation and reuse.

Keywords from the workshop presentations and during discussion were; the urgency of action for contaminated sites reclamation; acknowledgment of social and economic importance of their reuse; relevance for local development and demand for sustainability.

Substantial agreement was reached on the statement that the reuse of contaminated sites is one of the major challenges for local sustainable development and it calls for long term commitment of public action to take responsibility of our industrial heritage and put forth active governance of this process.

The exploratory workshop’s aim was threefold:

- to summarize the state of the art with respect to experiences and results of contaminated site reuse;
- to discuss recent developments in valuation of benefits deriving from contaminated site cleanup and reuse;
- to take advantage of the results from benefit estimation exercises to define local sustainable development strategies.

The explanatory workshop was divided in two parts and organized over two days. The first day covered issues related to review the state of the art with respect to local practices in contaminated sites reclamation and reuse. To this purpose, a review of national experiences constituted the focus of the first part of the workshop. The second day was organized in two sessions and devoted to analyze recent developments in economic valuation of contaminated site cleanup and reuse and to investigate the role of community involvement in the revitalization process. The first session dealt with the economic valuation of the benefits of brownfields remediation and reuse and was designed to provide an assessment of valuation methods and analyse the impact of contaminated site reuse on local development. The second session linked the policy experience with academic research in order to foster new development in economic valuation of contaminated site reuse and it helped to identify wider policy impacts and to assess the need for community participation as a trigger for sustainable reuse.

The workshop was organized along individual presentations and attended by invited participants (scholars or experts) and early stage researchers selected by an appropriate call for application.

The review of international experiences in brownfield redevelopment was discussed in 7 presentations: three of them reported the national experiences in brownfield reuse (Germany, France and Italy), by emphasising the policy approach adopted in dealing with brownfield clean up

and reuse and by showing the outcome of recent redevelopment projects. The remaining ones discussed some issues and lessons learned in managing brownfield reuse, namely:

- the challenges posed by climate change;
- the need to evaluate the effects of brownfield redevelopment projects; barriers to reuse and implementation reporting;
- coordination of the different stakeholders involved in the redevelopment process.

The assessment and valuation of the impacts of contaminated site reclamation and reuse on local and community development and was discussed based on 10 presentations covering the economic valuation of private and social benefits of brownfields cleanup and reuse, the main approaches used for the economic valuation of health benefits and case studies regarding the monetary assessment of benefits and the best practices adopted for a sustainable reuse of brownfields sites and active community participation.

One major outcome of the exploratory workshop was to allow open discussion and confrontation across various expertise and experience from participants with different backgrounds and responsibilities.

A second major outcome was to offer practical and theoretical support to young researcher increasing their confidence in their research work and the relevance of their efforts for public action and social development.

Another important outcome was the acknowledgement of the need of repeating similar experiences with the ultimate objective of applying for a research networking programme (ESF, 7<sup>th</sup> EU Framework Research project). The participants acknowledged that good relationship and networking could improve the state of current research, given that the workshop topic has not received so much attention academic research. Participants agreed that research and action in the area of contaminated sites remediation and reuse is quite multi-disciplinary and an effort should be made to include other disciplines and expertise such as engineering, epidemiology, geology and ecology competences in future work.

Publication of the results and papers has been highly recommended as well as the publishing of a policy briefing by ESF.

## 1. Introduction

In the context of urban development policies, derelict areas are important for implementing urban renewal and re-qualification, especially in the framework of environmental safeguarding, human health and sustainable development. One of the main problems we are faced with is bringing these derelict sites back onto the property market in order to guarantee their complete recovery and their return to an economically productive use (Grimski and Feber<sup>1</sup>, 2001). Both legislative and institutional factors contribute to trigger the processes of divestment and contaminated sites generation. An intervention aimed at re-qualifying and subsequently reclaiming these areas has a far-reaching impact that is difficult to quantify, and produces effects on human health, economic development, and the distribution of risk and of environmental responsibility (Clapp *et al.*<sup>2</sup>, 2000). This objective is particularly important now that the European Union proposed a Common Strategy for Soil Protection (COM(2006)231 final) and presented a proposal for a Framework Directive on Soil Degradation (COM(2006)232 final) the discussion of which has been highly controversial and currently under revision.

EU recognizes the need for an integrated and coherent action in order to prevent further soil degradation and restore environmental quality to a level appropriated with the intended reuse. The strategy recognizes that, to attain these objectives, policy intervention is also required at local, national and European levels. To this purpose, the Commission proposes a Framework Directive in order to ensure a comprehensive approach to soil protection whilst fully respecting subsidiarity. In particular, Member States will be required to take specific measures to address soil threats, but the Directive will leave them ample freedom on how to implement this requirement. As a consequence, “risk acceptability, the level of ambition regarding the targets to be achieved and the choice of measures to reach those targets are left to Member States”. This implies a detailed analysis of policy alternatives and their economic, ecological and social impacts. In particular, given the financial resources committed to site remediation, it is crucial to estimate the benefits deriving from this policy implementation. Considering EU Thematic Strategy’s objectives, degraded soils must be restored to “a level of functionality consistent at least with current and intended use, thus also considering the cost implications of the restoration of soil”. The soil’s intended use is of particular interest here, since it is a crucial factor in determining the successful and effective cleanup and reuse of contaminated sites, for several reasons. First, following a “fitness-for-use principle” (CLARINET<sup>3</sup>, 2002), the final destination of former contaminated sites determines the level of remediation and the consequent costs: for instance, residential uses require stricter cleanup standards with respect to other uses, such as the industrial ones. If the intended reuse is known before cleanup is started, the level of remediation can be determined accordingly and the consequent costs could result lower. The consideration of reuse alternatives is crucial in determining a different approach to policy definition. At the moment regulation is set up following a “Command and Control” approach, where cleanup standards are fixed, regardless of the prospective use. The consideration of reuse at the early stage of the remediation process definition is important because it could highlight unnecessary (with respect to final destination) cleanup measures. Secondly, considering reuse before cleanup makes it possible to justify the policy proposed on a cost-benefit analysis grounds, by comparing the costs of the different policy options with the stream of future benefits (both private and external) deriving from soil reuse.

There is an increasing interest in Europe to assess the impact of proposed regulation through cost-benefit analysis. This is particularly important in cases where the costs of cleanup are deemed excessive with reference to environmental and health benefits. It could be the case that the inclusion of private benefits deriving from cleanup with respect to a given reuse alternative could encompass

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<sup>1</sup> Grimski, D. and U. Ferber, 2001, Urban Brownfields in Europe, *Land Contamination and Reclamation*, 9 (1), pp 143-148.

<sup>2</sup> Clapp, T.L. and P. Meyer, 2000, Brownfields and Urban Commons: Common Property Frameworks in Urban Environmental Quality, Working Paper of Center for Environmental Policy and Management working paper.

<sup>3</sup> CLARINET, 2002, *Brownfields and Redevelopment of Urban Areas*, Austrian Federal Environment Agency.

the costs of reclamation. Moreover, in cases where public authorities do not have sufficient financial resources to cleanup degraded soil they need to involve private actors who, by discounting a future stream of benefits, find it profitable to participate in the reclamation process and relieve public actors from the financial burden of assuring cleanup. Different case studies from various countries show that urban and environmental re-qualification programs have helped to improve the economic, social and environmental conditions of these areas. In particular, they have helped to create new jobs, attract investment, improve existing infrastructure, reduce problems linked to sanitary risks, avoid future environmental contamination, reduce urban sprawl and pressure on greenfields and, lastly, revitalize the socially degraded surrounding areas. The processes at work in urban and environmental redevelopment are therefore linked to a city's economic and social development, and involve new subjects both in the public and private sectors capable of influencing a project's outcome. Many derelict sites, whether contaminated or not, lie in areas lacking the necessary economic resources to face the task of reclaiming them, and a central authority must step in to provide the institutional and economic tools necessary for managing the problem. Indeed it seems very likely that the private sector can react without the support of the public sector. Case studies in England, Germany and the U.S. show that, at times, private investment in derelict site redevelopment, when adequately supported, can be superior to public investment (OECD<sup>4</sup>, 1999). Another way to intervene is to encourage voluntary initiatives for the renewal of contaminated sites, as in the U.S. (Hula<sup>5</sup>, 1999), by guaranteeing flexibility and limited responsibility for those involved.

Within this context public bodies faces complex choices: they must be capable of following sophisticated decision-making processes, and be flexible and innovative in order to make full use of the progress in technology and information, as it becomes available in time. The economic assessment of realistic alternatives and their combinations cannot be foregone. In this context, knowing local preferences and gathering information from the various stakeholders involved provides the basis for an economic assessment of state intervention.

International experiences show that the redevelopment of derelict areas implies that all "pros" and "cons" both be assessed where these have an economic and environmental impact on the well-being of the entire community, and not just on the single site. This consideration introduces a wider perspective on urban regeneration and brownfield remediation. The system of relationships between all of the potential actors in the arena needs to be taken into account in a regeneration process regarding derelict areas. In a contaminated site and derelict lands a series of inter-connections and self interest have to be considered among the different actors: the landowners have a relevant role to define future uses and consequently the proper remediation to be implemented in the area; local governments have to solve the environmental problems connected with such remediation; local residents have to know if the area is suitable for everyday use or if the risk is high from health point of view; external investors have to acquire all the possible information about the sites to define an investment program, if profitable in terms of risk/opportunities balance. No one actor can achieve each purpose by themselves; given the complexity of their interaction. At the same time the relevance of the different actors and of various dimensions involved (environmental, economical, societal) have to be of equal importance in the decision process. Approaches offered by ecology seem appropriate in this respect and adaptive management perspectives seem to be applicable to land remediation and redevelopment processes. Within this perspective community involvement and long term public commitment are '*condicio sine quibus non*' i.e. conditions which are indispensable and essential in the reuse of contaminated sites for local sustainable development strategies.

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<sup>4</sup> OECD, 1999, *Urban Brownfields*, OECD Territorial Development Service.

<sup>5</sup> Hula, R.C., 1999, *An Assessment of Brownfield Redevelopment Policies: The Michigan Experience*, Department of Political Science and Urban Affairs Michigan State University, November 1999.

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The workshop was organized along individual presentations and attended by invited participants (scholars or experts) and early stage researchers selected by an appropriate call for application. The remaining part of this report is organized as follows: the next section provides the scientific content of the event by illustrating speakers contributions; an assessment of the results follows and to conclude, an evaluation of the outcome of the workshop is offered. This report is completed by providing information regarding the participants and the detailed description of the programme.

## 2. Scientific content of the event

After a short welcome note from the convenor Margherita Turvani, (University IUAV of Venice, Italy), the workshop was opened by Ashlian Kerç (ESF), who provided a brief introduction of the ESF's mission (i.e. to serve as a common scientific platform for its member states and explore new directions for research at the European level), expressed appreciation for the effort done to bring together scientists and policy makers and stressed that ESF exploratory workshops should pave the way to future activities.

An opening speech was given by Domenico Patassini (Dean of the Planning Faculty, University IUAV of Venice) who deals with brownfield reuse from a planning perspective. He pointed out that soil should be considered as a non renewable resource and recalled the important contamination legacy inherited from past industrialisation processes. He stressed that current industrial relocation patterns could entail a redistribution of environmental costs of production activities all over the word. By recalling the negative externalities entailed by contamination (i.e. environment and health effects), he claims that evaluation practices could foster new perspectives for policy design.

He concluded by emphasising that brownfield reuse policies are one of the most important components of urban renewal and containment of sprawl.

**The first day – Review of international experiences** – was devoted to the review of international experiences in brownfield cleanup and reuse.

**Detlef Grimski** (Federal Environmental Agency, Germany) illustrated German policy for brownfield reuse. He started by recalling legislative provisions for this issue (i.e. the Federal Soil Protection Act and the Federal Soil Protection and Contaminated Sites Ordinance), the legal definitions (with particular emphasis on the difference between suspected contaminated sites and contaminated sites), remediation options (decontamination methods to remove harmful substances; containment methods to prevent the spread of harmful substances and protection measures) and management tools (soil values and technologies). After having described the brownfield problem in Germany, by recalling that more than 215 thousand contaminated sites exist, he discussed how brownfield reuse is linked with urbanization and land consumption problems. In particular, he recalls that 150,000 ha of brownfields are located in urban areas (and they are equivalent to 1/3rd of housing construction needs and more than Germany's industrial construction needs); of these, 48.000 ha are ready for immediate development. He finally noted that daily greenfield consumption in Germany amounts to 113 ha (2002 – 2006). In fact, in Germany reuse options and spatial development are addressed by planning legislation (i.e. Federal Building Code, Federal Regional Planning Act and Federal States Building regulations with special requirements). He claimed that brownfield redevelopment is a major tool to reduce land consumption to the national target of 30 ha/day by 2020 and that fiscal incentives are necessary to reverse the trend in land consumption, such as to:

- To reform the systems of taxes on land and buildings and on the purchase of real estates;
  - To abolish public support for private housing construction;
  - Reduce tax incentives for long distance commuters;
  - To reform the system of budget compensation between municipalities/communities;
  - To analyse options for a system of permission trading for land development (modelled on the system for emission trading);
  - To analyse options for the introduction of a duty on greenfield development.
- Claudio Mariotti** (Sviluppo Italia Aree Produttive S.p.A, Italy), after having recalled the principal legislative acts regarding contaminated sites cleanup, clarified the administrative and financial aspects involved in the brownfield management that has to be addressed, namely: the relationships between public and private subjects;
- the urban aspect of “restoration and re-development”;



- some criteria for deciding the use of the territory (to be reviewed) and, most of all, the risk analysis instruments (to be optimized);
- the tax issue related to the property together with the capital and earnings enhancement of the areas themselves at the end of the restoration and re-development interventions. In fact,

he underlined that in Italy there are very few cases of efficient “remediation and reuse” processes because of difficulties connected to the administrative procedures and to the lack of specific regulation regarding the reconversion of the industrial polluted sites, besides the ordinary regulation provided for the restoration of polluted sites. He then recognised the high potential of brownfield redevelopment for the social and economical development of areas otherwise in economic decline. He also stressed that knowledge basis in Italy is not satisfactory, since standardised information sources are lacking. Information about the extent of contamination is incomplete and scattered evidence on contaminated sites reuse experiences is available. He then briefly illustrates the cases of Campi (near Genoa) and Rho (near Milan), by stressing the importance of funding availability to start up the brownfield redevelopment process. He then recalls recent Italian government policies, namely the “National extraordinary program for the economic-productive restoration of industrial contaminated sites”, which devoted more than 3 billion euros to the brownfield redevelopment. These financial resources will be available for former industrial sites located within the National Interest Sites (SIN) and in the Regional Interest Sites, included in the Regional Remediation Plans. An ad hoc Agency will be responsible for the implementation of the program. Besides financial measures, the Italian government also foresees to boost brownfield redevelopment through specific Program Agreements between involved stakeholders. He concluded his speech by listing the main critical aspects that slow down the start of the recovery and productive economical development processes.

**Dominique Darmendrail** (BRGM, Direction Générale, France) illustrated a review of the French experience, by recalling relevant legislation and focusing on the policy principles in brownfield remediation domain. In particular, she focussed on:

- precautionary (uncertainty should not delay the adoption of measures) and proportionality principles (investigation of effects of pollution through an iterative procedure);
- specificity principle: the aim of remediation is determined on a case by case basis, based on a specific risk assessment of the potential risks and on the intended uses of the sites;
- transparency principle: choices inherent to risk assessment must be presented, explained and discussed by interested parties;
- polluter pays principle: the owner of the former industrial site is considered the liable party. He must propose to the local authority appropriate measures.

She then explained how brownfield remediation takes place, by distinguishing two cases: one where prospective uses are fixed and the other one where they could change.

She concluded by presenting the case of the Ferronneries du Midi redevelopment project and by emphasising the success factors (i.e. concerted action with local authorities; large information to the public through local commissions; pollution treated within the project; no saturation of existing landfills in the area; costs integrated in the redevelopment project). **Ed Chu** (EPA Government, US) discussed the issue of climate change and contaminated properties. He started by listing the market and policy drivers for climate change and sustainability actions (i.e. rising energy prices; state and regional policies; changes in building practices; U.S. and international policy discussions and the shifts in public sentiment). To identify the potential benefits of greenhouse gas (GHG) reductions through sustainable land revitalization, he noted that land provides a carbon sink (sequesters approximately 12% of annual U.S. GHG emissions whilst vehicle miles traveled contributed 11% to total U.S. GHG emissions). He then stressed that usual land use produces adverse effects, because (1) reduced greenspace reduces carbon stocks and sinks, (resulting in GHG emissions); (2) increased infrastructure needs results in increased GHG emissions and (3) Vehicle miles traveled (VMT) increase. In fact, an average of 2.2 million acres of greenspace are developed each year in

the U.S, which in turn results in loss of carbon in soil and vegetation from natural land sink (estimated be 5% of total annual U.S. GHG emissions). Moreover, the loss of carbon sink entailed by new infrastructure constructed to provide services to developed greenspace amounts at around 0.6% of annual GHG emissions. Finally, emissions from growth in VMT are projected to increase 48% by 2030 if sprawling land development patterns continue. Thus, existing and emerging policies and markets position land management and restoration actions to play a role in addressing GHG emissions and climate change, provided that brownfields redevelopment avoid to use greenspace; clean energy is produced on brownfields; land restoration increases carbon sinks and greener remediation methods are adopted. If brownfield redevelopment produces a reduction of sprawl, he argued that: available community footprint is optimized; concentrated development reduces vehicle miles traveled; retained greenspace prevents GHGs from being emitted through development; reduced infrastructure needs results in GHG emissions avoided; green energy generation results in replacement of the traditional U.S. fuel mix and a reduction in GHG emissions. He then provided data to assess the technical potential of restoring land: he noted that to achieve the Kyoto Treaty proposal GHG reduction (7% below 1990 emission level), the potential carbon storage from reforesting mine lands could account for 4% to 12.5% of the total required emission reduction. He concluded by stating the importance of land management policies in GHG reductions and by stressing the need to explore policy and market mechanisms in support of sustainable land revitalization. He also suggested being cautious because of potential unintended negative consequences.

**Gundula Prokop** (Umweltbundesamt, Austria), after having briefly introduced Austrian policy for brownfield clean up and redevelopment, discussed the Austrian experience in evaluating the impacts produced by remediation activities, namely direct effects (improvement of the local environment and prevention of the migration of pollutants to sensitive environments) and indirect effects (CO<sub>2</sub> emissions, energy consumption, waste generation, water consumption and other). She also provided a quantification of ecologic and economic effects of remediation measures. In particular, she noted that implemented remediation measures improved the water quality of groundwater bodies in total of 46 mio. m<sup>3</sup>. This corresponds to an annual water consumption of 1.7 million persons. Contaminants of 9.9 million m<sup>3</sup> soil were prevented from further spreading into sensitive environments. 145 hectare brownfield land was reused and in eight cases the evaporation of landfill gas was averted. Austrian remediation measures generate about 1% of the annual waste production and 10% of Austria's disposed waste. In 1990 landfill gases contributed 4.3% to the national green house gas balance whereas in 2006 the contribution was only 0.8%. Regarding economic effects, between 1989 and 2006 about 1.1 billion Euros were spent on remediation activities which were in large parts funded by public money. 48% of this amount can be assigned to the building and engineering industry, 32% to the waste industry, about 15% to engineering and consulting services, and about 3% to the public sector. In total 144 contaminated sites were remediated with an average public funding rate of 80%. The majority of these cases were large sites with severe groundwater and soil contamination. Federal contaminated sites management creates about 330 full time jobs per year. She concluded that brownfield remediation had good performance with regard to GHG emissions. The weakest point of Austrian remediation experience is the large share of dig & dump technology. She also pointed out that aspects for the assessment of environmental and economic impacts were carried out "empirically" by using expert opinions, due to the lack of useful references from literature.

**Paul Syms** (English Partnerships, UK) reported the experience of the National Brownfield strategy, with particular emphasis on involving local communities. He first presented data regarding brownfield in England (i.e. vacant and/or derelict land and buildings; land and buildings in use with planning permission or potential for redevelopment; regional distribution of brownfield land, in use and not in use). Then he presented the effort made by England to tackle the issue of brownfield land, with particular emphasis on the National strategy, its objective (assessing the nature of the

barriers to reuse and to formulate a workable strategy), overarching principles and its four-strand approach to implementation (1. identify, assess and prepare brownfield; 2. safeguarding the environment; 3. enhancing communities; 4. Accreditation and skills). In March 2008 the UK Government accepted all of the Strategy recommendations and charged English Partnerships with several tasks to ensure delivery. In addition, other Government Departments and agencies are working to improve regulatory processes and to ensure that priority is given to reusing brownfield land. For many local authorities and for the Department for Communities and Local Government itself successful implementation of the National Brownfield Strategy is one of the key indicators against which delivery performance is to be measured. Monitoring the impact of the National Brownfield Strategy will be conducted by a newly formed National Brownfield Forum and will utilise the annual NLUD surveys. Effectiveness of the Strategy will be judged in terms of delivery expenditure against a variety of output indicators, including hectares of land reclaimed, new housing and employment buildings constructed and new infrastructure provided etc. It will also be assessed against wider outcomes, such as area regeneration projects supported or facilitated, area based economic improvements, and improvements in health, education and crime statistics.

**Jiřina Jackson** (Ředitel, IURS, Czech Republic) in her speech, reviewed recent initiatives in addressing brownfields at the national level, where various uncoordinated activities are carried out by different national sectoral actors and their programs. After reporting the extent of the contamination problem, she described current practices in brownfield redevelopment. She stated that most projects are privately led though, still limited involvement of municipalities/regions and some utilization of EU Structural Funds and instruments. She discussed pros (monitoring, education and support to owners) and cons (produced without stakeholders input; does not consider spatial and urban issues; ignores independence of CZ communities and regions) of the current strategy. The core of her discussion was devoted to the environmental guarantees given by the Czech government to the privatized industry. Until today, the state was capable of dealing with just 1/3 of EG. Owners are still waiting to have their plants cleaned up. In order to solve the remaining 1100 environmental guarantees to be given, the Czech government is planning to let a single PPP quazi-concession valued at around 5 billion €, covering the remaining state liability for the EG of privatized industry. The concessionaire should, within 8 years, remove all the contamination covered by the remaining EG and also take over all the environmental liabilities arising from these EG. The Czech state would make payments to the concessionaire for these services spread over a period of 30 years. After having reviewed some experiences, she concluded with the following recommendations:

- Coordination among initiatives and actors;
- Know-how and information to be provided (support web information and know-how source; Support knowledge developing platform; support expert information exchange);
- Strengthen redevelopment skills of owners and local authorities.

The **second day– Frontiers in contaminated site cleanup and reuse analysis** – was organised through two sessions.

### ***Session 1. Estimating the benefits from contaminated site cleanup and reuse***

This session aimed at analysing the recent developments in economic valuation of contaminated site cleanup and reuse, in order to provide an assessment of valuation methods and analyse the impact of contaminated site reuse on local development.

In the first presentation **Anna Alberini** (AREC, University of Maryland, US) identified the main benefits of brownfield cleanup and revitalization and described how it is possible to assign an economic value to them. In particular, the main benefits deriving from cleaning up and redeveloping brownfield sites are the reduction of risks to human health, the reduction of risks to ecological systems, the use of the property (commercial, industrial, residential and recreational services), less crime/more personal security, new possibility of employment, improved aesthetic/amelioration of blighted sites, and reduced development pressures on greenfields (less

sprawl, congestion). Not all of these outcomes can easily be measured whilst others can be measured, we don't know their value because there are no market transactions about them. To overcome this problem, it is possible to adopt the revealed preference method or the stated preference method. The most well-known revealed preference technique is the hedonic price model which assumes that the price of a real estate property absorbs all the different benefits that we have mentioned before, and through a regression analysis is possible to disentangle the different influences on property prices. Hedonic pricing requests a large amount of information and data as for example historical prices and characteristics, data on purchasers, and information on expectations. Stated preference techniques rely on what people *say* they would do under well-specified, hypothetical circumstances, and the major approaches are the contingent valuation, and the conjoint choice experiments. They can be applied to a variety of contexts, allow independent variation in attributes (risk, amenities, etc.)—the major problem of hedonics, can be adapted to study various possible categories of benefits from cleanup and reuse, and can be linked to hedonic pricing methods. But, the mainstreams economists tend to be to be skeptical (“ask a hypothetical question, get a hypothetical answer”) and sometimes can be difficult to select attributes of a policy, locale or home that are meaningful to both policymakers and to people. Alberini concludes saying that revealed and stated preference approaches are both possible for placing a value of cleanup and reuse of brownfields, each of them have strengths and weaknesses, and probably combining them might allow to overcome each method's weaknesses.

One of the main benefits of contaminated site cleanup up is the reduction of people's mortality and morbidity risk. The main aim of **Milan Ščasný's** (Charles University of Prague, Czech Republic) presentation was to provide a brief introduction in human health benefit valuation utilising the main outcomes and method developments available thanks to the EU funded R&D projects. After having introduced what is the impact of contamination on human health and how health impact assessment can be appropriately conducted, he explained a impact pathway approach developed within the ExternE project that allows quantifying health impacts attributable to airborne pollution. The main part of the presentation was devoted to illustrate how it is possible to monetise morbidity and mortality. In the case of morbidity there are three welfare components that need to be considered: medical costs, loss of productivity and dis-utility due to inconvenience, suffer or pain. Then, he introduced the main concepts of the valuation of mortality reviewing the main literature on the Value of a Statistical Life (VSL), and the value of Years of Life Lost (VOLY). Another important topic discussed by Ščasný was the economic valuation of cancer, and in particular he reported the main results of the literature relative to the valuation of so called dread 'premium'. In fact, there is a general support that the morbidity, fear, or dread associated with cancer might be a valid component of the cost that individuals attribute to the incidence of cancer. He documented, however, that despite the plausibility that there may be such premium, empirical support is rather limited. Whether one introduces the premium or not, the calculation of damage costs for the morbidity component of cancers might be worth to use anyway. The health impact assessment and the benefit valuation are very important because allow to properly identify the health impacts and the potential beneficiaries of the policy. Moreover, conducting cost benefit analysis provides evidence about social desirability of the project.

**Dimitris Damigos** (National Technical University of Athens, Greece) described and assessed the benefits from abandoned urban quarries rehabilitation comparing two different case studies and two different methodologies. In the first example, he illustrated the results of a contingent valuation study conducted at Viaropoulos, which is an abandoned quarry located at Galatsi Municipality, in the centre of Athens together with an application of the Fuzzy Delphi method. In the second example, he presented the results of an application of the Fuzzy Delphi method to assess the benefits of restoration of the Leventakis quarry site using real estate experts and face to face interviews.

The CV survey administered to a sample of 200 households from Galatsi Municipality asked people to value the attractiveness of three different rehabilitation plans: reforestation with backfilling, reforestation with total backfilling and partial backfilling, reforestation and installation of new land uses. He estimated that the mean WTP for reclaiming the quarry site varies between 30 and 58 euros, which gives an aggregated value between 240,000 - 525,000 Euros. However, he concluded that the benefits did not justify restoration costs that amounted to €4 million. In the same study, he also applied an expert based approach for identifying the effect of the rehabilitated quarry site to the property prices of the surrounding area. The process involved a target group of experts, who were questioned through a multi-stage survey, following the Fuzzy Delphi Method, which is a generalization of the classical Delphi Method by means of fuzzy logic. The specialists were called to determine the influence zone of the rehabilitated quarry site on the dwelling price, the premium attracted by dwellings located in the zone of influence, the percent differentiation in the value of two dwellings with common characteristics, regarding whether they hold a view towards the rehabilitated quarry. The expert opinion study reveals an aggregated value between 17.7 million and 35.5 million Euros, assuming that the surrounding apartments with view to the site would attract a premium between 18% - 36%.

In the second case study, the Fuzzy Delphi Method is also applied to estimate the consequences of three proposed rehabilitation projects on the dwelling price in the surrounding area: total backfilling and reforestation, partial backfilling, reforestation and soft recreational uses, and no backfilling, partial reforestation and more intense recreational uses. The experts were called to answer the abovementioned questions in all three comparisons of the consequences of the proposed actions. According to the estimates, the surrounding dwellings will attract a premium between 21% - 28%.

**Alberto Longo** (Queens University, Belfast, UK) described the determinants of brownfield regeneration in England using a data set from the National Land Use Database (more than 20,000 sites). This study is the first that aims to analyse with quantitative methods past decisions at brownfields. The regeneration of brownfield sites addresses problems of contamination and other development patterns that generate environmental problems and sprawl, improves the balances between urban, peri-urban and rural relationships by decreasing the conversion of agricultural land and rural sites to urban uses, identifies sustainable future opportunities, may increase the supply of affordable housing close to local amenities and open space, reduce inequalities, promotes economic growth in inner cities and make cities themselves less congested and safer places to live. Moreover, the reuse of brownfield sites is further incentivated in England because, already a decade ago, the Government announced that at least 60 per cent of new homes in England are to be built on previously developed land by 2008: a target that has been reached.

Through econometric techniques supported by GIS based data, he tried to answer to the following research questions: i) What (local) characteristics make a brownfield more likely to be regenerated? ii) Has brownfields regeneration mostly occurred in city centres, contributing therefore to limit urban sprawl? And iii) should size and location specific policies be suggested to better tackle brownfields reuse?

The modelling approach that Longo presented assumed that the regeneration of brownfield sites is a function of the site's characteristics (geographical location, size, distance to the city centre, previous activity at the site, housing suitability and ownership) and neighbourhood characteristics (e.g. population density and deprivation score of the area where the sites is located). The hypothesis was that a site could be in use if the net benefit to the owner was greater than the utility derived from the site if it was unused.

The results highlighted that the brownfield community has made some progress in redeveloping previously developed sites, but that some constraints still need to be overcome. The current goals of the government of building most new houses on brownfields is being achieved, but more resources, attention and specific policies are needed to redevelop difficult sites, such as large sites, sites that

have previously been used for commercial and industrial activities, sites that are located in the poorer and bleakest areas of cities and regions of England. It is finally interesting to highlight how the government does not seem to fully understand the opportunity cost of not developing publicly owned sites, as public ownership seems to be a constraint in regeneration.

Finally, the talk of **Stefania Tonin** (University IUAV of Venice, Italy) presented the results of a conjoint choice survey administered to a sample of 400 residents of Venice to investigate people's preferences for cancer risk reductions at contaminated sites, and reuse of idle/abandoned sites (whether or not contaminated). Specifically, she wanted to answer to three research questions: i) what is the value of a statistical case of cancer for these persons? ii) Is the value that people ascribe to reductions in their risk of cancer related to their perceived exposures and to other individual characteristics, such as age and education? And iii) Do people care solely for reductions in the risks of human health due to contaminated site exposures, or are they also prepared to pay for the redevelopment and subsequent reuse of the abandoned contaminated sites? The Value of a Statistical Case of Cancer is considered the appropriate construct to use when estimating the benefits of contaminated site remediation, since risk assessments at contaminated sites typically produce estimates of lifetime excess cancer risks. In the economics and valuation literature there are few studies that explicitly calculate the value of a statistical cancer. After an exhaustive description of the questionnaire and a brief sketch of the problem of contaminated sites in the Province of Venice, she explained the features of the random utility model used to elicit the willingness to pay for programs that would target abandoned sites and promote their reuse. Statistical elaboration of the responses to conjoint choice questions estimated that the respondents' value of a statistical case of cancer is €2.6 million, but that among people who see contaminated site from their homes the value of a statistical case of cancer actually declines with distance from the site. The value of a statistical case of cancer is higher among more highly educated people and lower among people aged 60 and older. She also found that people are prepared to pay large amounts of money for programs that deliver reuse of the idle properties, whether contaminated or not, but this is true only for specific types of reuse—for residential purposes, especially when the properties are contaminated, and public parks and community recreational facilities, whether or not the properties are contaminated.

### *Session 2. Wider Impacts and community development*

The second session of the day had the specific purpose to survey the main intersectorial impact of urban regeneration and brownfields remediation, with special attention to the possible contribution of local communities to define reuse scenarios and regeneration approaches. Which are the roles of local communities? And in which ways can they contribute to define the regeneration procedure and approach? This part of the conference tried to focus the different policies that can contribute to define a general framework for brownfields redevelopment.

During the first presentation, **Peter Meyer** (University of Louisville, US), focussed his talk on costs and external risks of brownfields remediation and introduced the idea of a “clean to use” protocol to reduce, on the one side the cost of a total pollutants removal and on the other the potential risks for local communities “attending” the areas according to the different purposes of land reusing (working or residential reuses). In the speech of Meyer the removal process has also been indicated as a potential polluting source especially to the communities living near the contaminated sites, to the residents and properties along the routes over which the removed contaminants are moved away by trucks or other facilities, and to the population of the zones in which disposal sites for removed polluted land are established. Meyer put in evidence a risk included within the concept of *clean to use standard*: a huge quantity of the pollutants, even if encapsulated, remains on the ground and every real estate or commercial redevelopment of these areas have to face to such a risk.

In Meyer's perspective the experience of community-based organizations promoted in the US, can also be adaptable to the EU context, as the social housing organizations of different EU countries can provide lessons for the US.

A more relevant issue to be considered is the ownership of the land. In fact the continuity of ownership contributes to the potential for maintenance of *long term stewardship* of property that has passed through the different phases of remediation process.

If the continuity of ownership is maintained, information about site conditions is not lost through successive real estate transactions, usually in fact the national and local records keep information about the property itself and not about the remediation processes set on that specific area.

According to this perspective:

- The owners have clear financial interests in minimizing risks and maintaining controls on land uses, even if such controls require expenses or further investments;
- The owner have a strong interest to avoid risks and reduce insurance costs from active monitoring of the condition of the area (present and past) and from acquiring current information about remediation processes activated, obtained improvement of the environmental quality, but also failures that could modify future asset values;
- At the same time every owner has an economic interest to assure that occupants or users of the area are informed about all the risk avoiding behaviors they have to keep during any excavation works that can damage the protected surface.

**Joe Doak** (University of Reading, UK) introduced a wide reflection of urban regeneration and brownfield remediation. He focussed his presentation on the system of relationships between all the potential actors and relationships to be taken into consideration in a regeneration process regarding derelict areas. In a contaminated site and derelict lands a series of inter-connections and self interest have to be considered among the different actors: the landowners have a relevant role to define future uses and consequently the proper remediation to be implemented in the area; local governments have to solve the environmental problems connected with such remediation; local residents have to know if the area is suitable for everyday use or the risk is high from health point of view; external investor have to acquire all the possible information about the sites to define an investment program, if profitable in term of risk/opportunities balance. No one actor can achieve each purpose by themselves; they essentially need each other. And at the same time the relevance of the different actors (human or physical/biological) have to be of equal importance in decision process. Doak suggests to borrow instruments of *adaptive management* to be applied at land remediation processes, in particular:

- A broad range of 'actors' have to be involved in planning and remediation processes
- Institutional innovations have to promoted
- Monitoring and review have to find out critical uncertainties
- The integration of actor strategies and decisions have to be supported
- Employing policy learning to projects and programmes

The regeneration/remediation process create a new range of relationships that can be mapped by actor network theory. If one side the key network builders lead the process (usually the owners and/or the developers), on the other they usually have to find out a compromise with all the other actors involved, adapting aims and expectation to a general view. The new local scenario made of actors, economic fluxes, materials becomes tied to existing networks. At the same time the new actors appears tied to all the active relationships and these sharing of visions will help the remediation process to reach a more proper balance among all the expectations. Also in presence of such networks and interest sharing, Doak admits that any redevelopment process is not straightforward; some actors are included in the process, but many others will be excluded; at the same time all the local and general conditions will have a direct influence on the possible outcomes.

The presentation of **Xin Li** (Massachusetts Institute of Technology, US) starts from an interesting comparison between the late 50's in US and the current years in China from economic and historical point of views. In the case of the Love Canal neighborhood, a community - within the Buffalo-Niagara region of the US - was settled on an industrial chemical dumpsite without proper remediation creating a number of health problems 30 years later. In contemporary China similar approaches to industrial area reuse, brownfields in particular, can bring similar risks for the local population from a health perspective.

The problem is quite urgent because many Chinese cities have been moving polluting plants and industrial enterprises from urban areas to the less-developed suburbs. Only in Beijing metropolitan areas, between 2000 and 2005, a relevant number (144) of traditional manufacturing plants were moved outside urban areas.

It is possible to imagine that the presence of former industrial sites, mainly polluted, are too quickly converted into residential or commercial purposes, a speed of conversion not compatible with a proper process of remediation; mainly it is a problem of not well-established brownfield development regulations by Chinese governments at all the levels. The presentation revealed that China has few relevant national-level soil cleanup standards for urban land assessment even if some elements support the expectation that, in a short period of time, the different level of governments will define laws, regulations, and cleanup standards for polluted land, as well as the necessary incentive policies to support local public actors involved in land recycling programs.

In this perspective Li introduced the topic of *land recycling* as more comprehensive in the idea of "brownfields cleaning up". A comprehensive recycling process applied to land (polluted land in this case) integrating aspects of public health, environmental quality, economic development, and protection of property rights within the redevelopment process.

If the Chinese government quickly imposes general guidelines for redevelopment of contaminated land local governments will probably have the ability to ensure a sustainable and healthy industrial land redevelopment.

The presentation of **Francesc Munõz** (UAB, Spain) focussed on the urbanization processes and policies promoted by Mediterranean cities with special attention to the relevance of urban sprawl and land consumption phenomena. In this sense any policy of land recovery or more in general, of built environment reuse and remediation appear as a sustainable alternative to greenfield use for urban development. According to Munõz's presentation, the urban situation of the Mediterranean has not been yet sufficiently recognised and described. Urban planners and decision-makers continue to support urban policies strongly connected with the compact city model, from one side a more suitable model for Mediterranean cities, but at the same time it is an interpretation model that do not include in the picture recent phenomena such urban sprawl. In a certain sense the compact city model, takes policy makers to wrong diagnosis and unsuitable solutions if it is not adapted to the new kind of urban development.

The approach followed in the presentation introduced three relationships between different characteristics of land and possible uses. There are three possible scenarios:

- *openfields* are related with agriculture;
- *brownfields* have a strong relationship with production and industrial issues;
- *greenfields* represents an eco-balanced use of land, for this reason are suitable in a sustainable perspective;
- *smartfields* include the extra-value of strategic and cultural expressions.

Munõz's presentation put at the fore front the real dimension of urban sprawl in Mediterranean cities - in Spain and surrounding Barcelona in particular - with a number of examples of the current approaches to both urban and environmental planning.



At the end of the session, the presentation of **Marie Howland** (University of Maryland, US), focused on the market for Brownfield sites in U.S. cities exploring the border between brownfield cleanups undertaken by the private sector and the conditions that require public involvement and subsidy, with particular refer to the case of Baltimore (Maryland). Prof. Howland introduced two case studies: Camden Crossing and a range of central city redevelopment projects.

The first case is a city promoted project with the aim to reconvert an abandoned and contaminated industrial site into middle-income neighbourhood. The case suggested interesting relationship between three main conditions:

- the strength of local market demand;
- the level of contamination;
- possible new use to be implemented (industrial-industrial or industrial – residential).

In general when the market conditions are stronger, the contamination is not so relevant and the use remains industrial, the private sector is more available to be the initiator, without public subsidies, to redevelop the area for new investment. But if the project requests a conversion of the use of the area, from industrial to residential, the cleaning up is more complicate and expensive and often requires a public sector support to be implemented. Private sectors take part in the process but after a relevant commitment of public bodies involved from case to case. The second study analyzed the role that land contamination plays in central city redevelopment. Howland surveyed all sales and selling prices in an industrial area at the southwest of Baltimore. The tendency revealed by the research is that contaminated land has been put into the market at a lower price.

In the last part of the presentation she introduced the role of site cleaning up to revitalize local communities. In this perspective brownfield remediation appears as a positive element to social improvement and job creation even if this effect is stronger where the local market is quite active. The cleaning up and regeneration itself do not increase job creation if the market is not suitable for new investment in redeveloped areas.

These situations need innovation by policy makers to introduce programs to link the regeneration of the derelict areas with subsequent investments by private actors to create local job opportunities for local people.

At the end of the second session, Prof. Kerc recommends to apply for a research networking programme of ESF and to include other expertises such as engineering, medical and physical sciences.

Another point which could be interesting as a workshop result, is the publication of a policy briefing or a science position paper considering the experiences of the different countries involved in the workshop. Moreover, by publishing such a policy briefing, it would be possible to get a better dissemination of ideas and experience to other countries.

Margherita Turvani closed the workshop by thanking all the participants for their active involvement and for contributing to the stimulating debate.

### 3. Assessment of the results

Before the exploratory workshops, some research questions have been anticipated to the speakers, so as to lead the discussion during the two days. The answers are summarised below.

The presentations made during the **first day – Review of international experiences** – outlined very different situations at national levels, in terms of extent of contamination, knowledge of the problem, institutional arrangements used to address brownfield redevelopment at local scale.

*What is the extent of the knowledge regarding contaminated sites?*

To sum up, it can be said that:

- an improvement of knowledge base can be seen, since national and regional surveys have been carried out in different countries. However, the knowledge of this phenomenon is not uniform across Europe and efforts should be devoted to this issue.
- An increase of the awareness of overall benefits deriving from brownfield redevelopment is acknowledged by the ESF workshop participants. However, it is noteworthy that, whilst earlier brownfield cleanup and reuse has been driven mainly by health and environmental benefits, nowadays policy makers are more and more focusing on wider community benefits, such as sprawl reduction and urban renewal.

Success stories exist but brownfields redevelopment is still a challenge for local policy makers. Examples of long term non-reuse are recognized.

*Can we conclude that there is a certain degree of uniformity in policy approaches adopted for brownfield reuse?*

At European level, an attempt to define a common framework in dealing with brownfields has been done, as emphasised in the introduction. Regarding policy making, considering that brownfield redevelopment has to tackle several market failures, the ESF Exploratory Workshop participants recognized that some form of policy intervention is needed. However, different government layers (EU, national, local) are involved and should be coordinated. The issue of subsidiarity is recognised by the Soil Strategy. Some issues are best managed at local level, whilst other ones necessitate a higher government layer.

*What kind of policy instruments are adopted? Are they integrated with other sectoral policies?*

It is also useful to note that a variety of policy instruments are available for brownfield redevelopment. Analogously to what is experienced by other environmental policies, in brownfield cleanup and reuse there has been a shift from regulatory instruments to market based ones. In particular, several participants stressed the importance of financial incentives in dealing with brownfield reuse. Another crucial aspect is the integration of brownfield reuse policies with town and land planning instruments at the different levels of government.

Finally, different degrees of private sector involvement could be foreseen in redevelopment process. Public and private participation in redevelopment varies from country to country.

**The second day – Frontiers in contaminated site cleanup and reuse analysis** – was organized in two different sessions.

#### *Session 1. Estimating the benefits from contaminated site cleanup and reuse*

The organisers anticipated to the speakers in this session, three questions that needed to be examined during their talks or discussion.

*If there are valuation experiences in different countries, what kind of methodologies is more frequently used, what methodology could be recommended, and what are the benefits that you value?*

More research on economic valuation of benefits is needed. The economic valuation experiences reported by the speakers are prevalently based on stated preference techniques. The revealed and stated preference approaches are both possible for placing a value of cleanup and reuse of brownfields, each of them have strengths and weaknesses, and probably combining them might permit overcoming each method's weaknesses. The use of one methodology instead of the other depends on data availability, on type of benefits to be valued and on the objectives of the study.

The valuation of environmental benefits is crucial in policy making (and also introduced in the proposed Framework Directive). Monetisation of environmental costs and benefits help to evaluate the redevelopment projects according to their financial profitability and their performance towards sustainable development. Moreover, it can prioritise brownfield regeneration in terms of emergency and net social benefits gained. During the presentations, attention was devoted to intangible benefits, such as environmental and health damages applying contingent valuation or choice experiments. However, there has been a common consensus to identify other important benefits such as the reduction of development pressure on greenfields sites, protection of public safety, protection and recycling of soil resources, restoration of former landscapes and reduction of crime.

*Are risk assessment outcomes considered in some way in the valuation exercises?*

In some countries, the availability of risk assessment results is not so simple. Only the case study of Italy, an economic valuation of cancer risk reduction obtained from cleaning up contaminated sites, has utilized data from epidemiological analysis. What is also interesting for the type of economic valuation examples that were discussed in this workshop, are the possibilities to implement the health impact assessment (HIA), a practical approach used to judge the potential health effects of a policy, program or project on a population, particularly on vulnerable or disadvantaged groups. The Czech case study provides information and useful data regarding this approach and how it is possible to implement it. People agreed that the main conclusion was the importance to integrate socio-economic analysis in assisting decision makers to reach a balance between the risks, costs and benefits associated with environmental risk management.

*Do the valuation studies inform policy making (e.g. are they a key input for cost benefit analyses)? Is benefit-cost analysis used in the policy process?*

The different studies illustrated in the workshop were based on the assumption that the results can address policy making of their countries.

Benefit-cost analysis is a tool for judging desirability of a given public interventions or policies that can influence the social welfare. Health benefits, in the form of reduced premature mortality and reduced morbidity, dominate all other type of benefits. Unfortunately, only in US and United Kingdom, benefit-cost analysis is regularly used in policy process.

## ***Session 2. Wider impact and community involvement***

This session appeared as quite heterogeneous because some speakers stressed the role of local community, others the general impacts and crossing issues of brownfields remediation and urban regeneration.

Some general questions have been asked to guide speakers in their presentations:

- *In which ways can you define a proper planning protocol to involve local community since the very beginning of the processes?*
- *Can local community be "active witness" in the changing scenarios of derelict land reuses?*

- *What are the general impacts (positive and negative) of brownfields redevelopment?*
- *Which are the wider advantages for local communities?*

The perspective of local community is clear: if local inhabitants are involved in the building scenario processes before the implementation of any reuse project, the results in terms of local acceptance, advantages and efficaciousness are more relevant. From the side of community a range of the main issues have been introduced by speakers:

- The building of networks among actors (both from civil society and from the public and private market) involved in regeneration process is fundamental to assure a proper remediation and reducing the possibility of exclusions in the different phases of decision process;
- brownfield remediation appears as a positive element to social improvement and job creation even if any effect of regeneration is stronger where the local properties market is active (remediation itself is not a guarantee of social advantage);
- In case of ownership continuity, information about site conditions is not lost through successive real estate transactions. This condition helps maintenance of *long term stewardship* on the areas to be regenerated.

From a wider impacts perspective the remediation of brownfields can contribute to the saving of soils (Greenfield) for urban development with relevant advantages from the environmental point of view:

- The concept of “brownfields remediation”, can be substituted with the idea of *land recycling* because a comprehensive recycling process applied to land (polluted land in our perspective) integrating aspects of public health, environmental quality, economic development, and protection of property rights within the redevelopment process;
- Brownfield remediation can be considered as an effective policy to contain urban sprawl.

#### 4. Outcome

The ESF Exploratory Workshop was a unique occasion to bring together scientists and policy makers, to discuss the main issues regarding brownfield redevelopment.

In the spirit of ESF objectives, the workshop was structured so as to allow in depth discussion of the obstacles and success factors in brownfield redevelopment, and on the manners benefits arising from redevelopment could adequately been taken into account, given the high potential brownfield reuse has in boosting local economic development.

The outcome of the EW has been a set of open questions that could be addressed by further research activities. We recall them briefly below.

The presentations made during **the first day – Review of international experiences** – and the following discussions made it possible to clarify the critical issues in brownfield redevelopment. It can be concluded that effective brownfield redevelopment crucially depends on institutional, economic-financial and social aspects.

Researchers agreed that institutional aspects are crucial in boosting or hindering the effectiveness of brownfield redevelopment, in particular liability regimes and property rights.

In the recent years, financial aspects also proved to be more challenging. Until recently, public financial resources have been the main source of funding. However the financial constraints local authorities face entail an increasing interest in looking for private capitals to finance brownfield redevelopment. It is thus of interest to understand what incentives are needed to boost private sector investments in redevelopment. Moreover, given the scarcity of financial resources, it is crucial to establish which sites should be financed and redeveloped first.

Once these issues have been addressed, one should also pay attention to how to reuse (e.g. previous vs. new uses, sustainable buildings, soft uses).

Finally, social aspects are also important, once we consider that in any brownfield redevelopment projects there are stakeholders who gain and others who lose something. As a consequence, distributive issues deserve particular attention. The attention for actors involved in redevelopment processes (working with local communities) is noteworthy because, if adequately addressed, it could represent an opportunity for improving the degree of public participation (and not an obstacle to redevelopment) and to get wider positive impacts. This aspect has been particularly emphasized during the workshop, by recognizing that there is the need to move from a focused analysis on particular aspects (i.e. health, environmental, land use patterns, mobility) to a wider perspective.

The **second day – Frontiers in contaminated site cleanup and reuse analysis** – of the workshop was organized in two different sessions.

##### *Session 1. Estimating the benefits from contaminated site cleanup and reuse*

Researchers tend to view the cleanup and reuse of contaminated sites as an environmental problem first, and then as an economic development challenge. The aim of this session was to identify, and possibly, to assign a monetary value to some of the benefits of cleaning up contaminated sites. We all agreed that there is a considerable difference between benefits and impacts/effects of remediation process. Economic benefits are any increase in the utility or wellbeing to an individual, group or society associated with the cleanup operations, impacts are market-based and physical effects associated with the same remediation process. Moreover, the same effect can have two different interpretations. For example, the rising property value associated with a site cleaning up could be an important benefit but could also have a negative impact if the process of redeveloping creates gentrification that squeezes out people from a certain residential area. Another difficulty is related to the fact that when you cleaned up a site, you don't have immediately adjustments in land

values because social problems, such as high unemployment rates, low education level, and crime, are long-lasting.

Effects can be positive or negative. Since the effects continue on time, an impact can be negative or positive in the very short term and, then change and develop new effects. What is important is the redistribution effect of these remediation and redevelopment processes.

The improvement of human health, or the risk reduction associated with cleanup, recognized as a substantial part of the total economic value of remediation and redevelopment process, represents an important challenge for the economists. In general, empirical studies tend to focus on risk perception instead of actual risk. For economists this is a key issue, it is very important to figure out how to correctly estimate health benefits. Finally, we agreed that cost benefit analysis could be an important tool that can inform decision makers and, along with other instruments like risk assessment, can help to make a decision.

### ***Session 2. Wider impact and community involvement***

The role of local communities has been considered by the different speakers of the second session from different perspectives. First of all the communities can play an active or passive role, as promoters of remediation scenarios (making proposal and expressing needs both of physical conversion but especially of job creation and social support), or as secondary level actors within a policy framework defined by others, often somewhere else. If land has a public owner (or mixed), the conventional approach would be for a local authority to commission developers to plan and design a redevelopment of a derelict area, including all the necessary cleaning up process, if polluted, according with the subsequent use of land.

We have to distinguish two cases according to the ownership of land (both if it is directly involved in the remediation, but also the surrounding the area). A sort of continuity/connection in the ownership (or between the subsequent owners) can guarantee a flux of information not always accessible on public databases regarding property markets, creating a form of *stewardship* for the area. At the same time also if the community is not directly interested in land ownership, it can represent a long term guarantee if involved by local authorities in the remediation processes, especially in the case or conversion from an industrial area to a housing estate.

In the concluding part of the EW it has been agreed to continue working in close cooperation, by setting up a research network and by looking for funding opportunities for further collaboration (e.g. ESF networks, 7<sup>th</sup> EU Framework Program).

Another way to cement this cooperation effort will be a joint publication (edited by the convenor), for example, a special issue on a peer reviewed journal.

## 5. Definitive list of participants

### CONVENOR:

1. **Margherita TURVANI**  
Department of Planning  
University IUAV of Venice  
Santa Croce 1957  
30135 Venezia  
Italy  
[margheri@iuav.it](mailto:margheri@iuav.it)

### ESF REPRESENTATIVES:

2. **Galin GORNEV**  
Senior Research Fellow  
Department of Sociology of Science and  
Education  
Institute of Sociology  
Bulgarian Academy of Sciences  
Moskovska str. 13A  
1000 Sofia  
Bulgaria  
[galingornev@abv.bg](mailto:galingornev@abv.bg)
3. **Alishan KERC**  
Department of Environmental Engineering  
Faculty of Engineering  
Marmara University  
Marmara Universitesi Muhendislik Fak  
Cevre Muh. Bolumu  
34722 Istanbul Kadiköy  
Turkey  
[kerc@eng.marmara.edu.tr](mailto:kerc@eng.marmara.edu.tr)

### SPEAKERS:

4. **Anna ALBERINI**  
AREC and National Center for Smart Growth  
University of Maryland  
College Park  
Washington MD 20742  
United States  
[aalberini@arec.umd.edu](mailto:aalberini@arec.umd.edu)
5. **Ed CHU**  
1200 Pennsylvania Avenue  
N.W MC5101T  
Washington DC 20460  
United States  
[Chu.Ed@epamail.epa.gov](mailto:Chu.Ed@epamail.epa.gov)
6. **Dimitris DAMIGOS**  
School of Mining and Metallurgical Engineering  
National Technical University of Athens  
9 Iroon Polytechniou str.  
157 80 Athens Zografou  
Greece  
[ddamigos@central.ntua.gr](mailto:ddamigos@central.ntua.gr)
7. **Dominique DARMENDRAIL**  
BRGM Direction Générale  
3 Avenue Calude Guillemain  
BP 36009  
Orléans Cedex  
France  
[d.darmendrail@brgm.fr](mailto:d.darmendrail@brgm.fr)
8. **Joe DOAK**  
Department of Real Estate & Planning  
The University of Reading  
Whiteknights  
PO Box 219  
Reading Berks, RG6 6AW  
United Kingdom  
[a.j.doak@reading.ac.uk](mailto:a.j.doak@reading.ac.uk)
9. **Detlef GRIMSKI**  
Umweltbundesamt - Federal Environment Agency  
Postfach 1406  
06813 Dessau  
Germany  
[detlef.grimski@uba.de](mailto:detlef.grimski@uba.de)
10. **Marie HOWLAND**  
School of Architecture, Planning, and Preservation  
University of Maryland  
College Park  
Washington MD 20740  
United States  
[mhowland@umd.edu](mailto:mhowland@umd.edu)
11. **George HUTCHINSON**  
Queen's University Belfast  
David Keir Building  
Stranmillis Road  
Belfast BT9 5AG  
United Kingdom  
[g.hutchinson@qub.ac.uk](mailto:g.hutchinson@qub.ac.uk)

12. **Jiřina Bergatt JACKSON**  
IURS- Institut pro udržitelný rozvoj sidel o.s.  
Minskà 6  
10100 Praha 10  
Czech Republic  
[jjackson@volny.cz](mailto:jjackson@volny.cz)
13. **Xin LI**  
Massachusetts Institute of Technology  
60 Wadsworth St.  
02142 MA  
United States  
[xinli@MIT.EDU](mailto:xinli@MIT.EDU)
14. **Claudio MARIOTTI**  
Italia Aree Produttive SpA  
via Pietro Boccanelli 30  
00138 Roma  
Italy  
[cmariotti@sviluppoitaliaareeproductive.it](mailto:cmariotti@sviluppoitaliaareeproductive.it)
15. **Peter MEYER**  
Center for Environmental Policy and Management  
University of Louisville  
426 Bloom Street  
Louisville KY 40208  
United States  
[pbmeyer@louisville.edu](mailto:pbmeyer@louisville.edu)  
[pbmeyer02@louisville.edu](mailto:pbmeyer02@louisville.edu)
16. **Francesc MUNOZ**  
UAB - Universitat Autònoma de Barcelona  
Edificio B  
Bellaterra  
08139 Barcelona  
Spain  
[Franc.Munoz@uab.es](mailto:Franc.Munoz@uab.es)
17. **Gundula PROKOP**  
Umweltbundesamt  
Spittelaure Lande 5  
1090 Wein  
Austria  
[gundula.prokop@umweltbundesamt.at](mailto:gundula.prokop@umweltbundesamt.at)
18. **Milan SCASNY**  
Charles University Environment Center  
Charles University in Prague  
U Krize, 8  
158 00 Prague 5  
Czech Republic  
[Milan.Scasny@czp.cuni.cz](mailto:Milan.Scasny@czp.cuni.cz)
19. **Paul SYMS**  
English Partnerships  
Arpley House  
110 Birchwood Boulevard  
Warrington WA3 7QH  
United Kingdom  
[PaulSyms@englishpartnerships.co.uk](mailto:PaulSyms@englishpartnerships.co.uk)
20. **Stefania TONIN**  
Department of Planning  
University IUAV of Venice  
Santa Croce 1957  
30135 Venezia  
Italy  
[tonin@iuav.it](mailto:tonin@iuav.it)

#### YOUNG RESEARCHERS:

21. **Stephan BARTKE**  
Helmholtz Centre for Environmental Research  
Permoserstr.15  
04318 Leipzig  
Germany  
[stephan.bartke@ufz.de](mailto:stephan.bartke@ufz.de)
22. **Glory EDOZIEN**  
University of Reading  
Whiteknights  
PO Box 219  
Reading Berks, RG6 6AW  
United Kingdom  
[gdozien@yahoo.com](mailto:gdozien@yahoo.com)
23. **Elisa GATTO**  
Dipartimento DESMAS "V. Pareto"  
Università di Messina  
Via T. Cannizzaro 278  
98122 Messina  
Italy  
[egatto@unime.it](mailto:egatto@unime.it)
24. **Alberto LONGO**  
Queen's University Belfast  
David Keir Building  
Stranmillis Road  
Belfast BT9 5AG  
United Kingdom  
[a.longo@qub.ac.uk](mailto:a.longo@qub.ac.uk)
25. **Noriko OTSUKA**  
Oxford Brookes University  
Headington Campus  
Gipsy Lane  
Oxford OX3 0BP  
United Kingdom  
[notsuka@brookes.ac.uk](mailto:notsuka@brookes.ac.uk)
26. **Srdjan SUSIC**  
Regional Environmental Center  
Ady Endre ut. 9-11  
2000 Szentendre  
Hungary  
[ssusic@rec.org](mailto:ssusic@rec.org)



27. **Jan VOTOCEK**  
IURS - Institute for Sustainable Urban  
Development  
Minská 6  
110 00 Prague  
Czech Republic  
[janvotocek@iurs.cz](mailto:janvotocek@iurs.cz)

28. **Harry WALTON**  
University of Bath  
Claverton Down  
Bath BA2 7AY  
United Kingdom  
[hlw20@bath.ac.uk](mailto:hlw20@bath.ac.uk)

#### **RAPPORTEURS**

29. **Francesco MUSCO**  
Department of Planning  
University IUAV of Venice  
Santa Croce 1957  
30135 Venezia  
Italy  
[cesco@iuav.it](mailto:cesco@iuav.it)

30. **Vania PACCAGNAN**  
Department of Planning  
University IUAV of Venice  
Santa Croce 1957  
30135 Venezia  
Italy  
[vania@iuav.it](mailto:vania@iuav.it)

## 6. Statistical information on participants

Total number of participants	28 (not including ESF representatives)	Country of origin – affiliation	
		Austria	1
Sex		Czech Republic	2
Male	16	France	1
Female	12	Germany	2
		Greece	1
Age bracket		Hungary	1
Under 30	9	Italy	6
30-40	5	United Kingdom	7
40-50	10	United States	5
50-60	3	Poland	1
Over 60	1	Spain	1

## 7. Final program

### Monday 26 May 2008

<b>Day 1</b>	<b>Review of international experiences</b>
12.15-13.15	<b>Registration and welcome buffet</b>
13.15-14.00	<b>Opening and Welcome – Margherita Turvani</b> (Convenor, University IUAV of Venice, Italy) <b>and Domenico Patassini</b> (Dean, Faculty of Planning, University IUAV of Venice, Italy) <b>Presentation of the European Science Foundation (ESF)</b> <b>Aslihan Kerç</b> (Standing Committee for Life, Earth and Environmental Sciences) and <b>Galin Gornev</b> (Standing Committee for the Social Sciences)
14.00-14.30	<b>Brownfield redevelopment in Germany – Options for reusing German Railways properties in different locations</b> <b>Detlef Grimski</b> (Federal Environmental Agency, Germany)
14.30-15.00	<b>Remediation and re-use of polluted industrial settlements: Italian experiences and programs, Claudio Mariotti</b> (Sviluppo Italia Aree Produttive S.p.A., Italy)
15.00-15.30	<b>French approach on contaminated land management: legal framework and reclamation of former industrial sites in an urban area, Dominique Darmendrail</b> (BRGM, Direction Générale, France)
15.30-16.00	<b>Climate change and contaminated properties, Ed Chu</b> (US Environmental Protection Agency, USA)
16.00-16.30	<b>Discussion held by Rapporteur: Vania Paccagnan</b> (University IUAV of Venice, Italy)
	16.30-16.45 <i>Coffee break</i>
16.45-17.15	<b>Evaluation of economic and environmental impacts of Austria's Contaminated Sites Management System, Gundula Prokop</b> (DI, Altlasten, Umweltbundesamt, Austria)
17.15-17.45	<b>Involving local communities in the effective and efficient reuse of contaminated and derelict land, Paul Syms</b> (English Partnerships, UK)
17.45-18.15	<b>Czech instruments considering brownfields sites and their projection into local sustainable development strategies, Jiřina Jackson</b> (Ředitel, IURS- Institut pro udržitelný rozvoj sídel o.s., Czech Republic)
18.15-18.45	<b>Discussion held by Rapporteur: Vania Paccagnan</b> (University IUAV of Venice, Italy)
18.45 - 19.00	<b>Closure</b>
	20.00 <i>Dinner</i>

### Tuesday 27 May 2008

<b>Day 2</b>	<b>Frontiers in contaminated site cleanup and reuse analysis</b>
09.00-12.45	<b>Session 1:</b> <b>Estimating the benefits from contaminated site cleanup and reuse</b>
09.00-09.30	<b>Private and Social Benefits of Brownfield Cleanup and Reuse, Anna Alberini,</b> (AREC and National Center for Smart Growth, University of Maryland, USA)
09.30-10.00	<b>Health valuation in EU Projects: What can be learned for contaminated sites clean up studies, Milan Scasny</b> (Charles University of Prague, Czech Republic)
10.00-10.30	<b>Assessing the benefits from abandoned urban quarries rehabilitation, Dimitris Damigos</b> (National Technical University of Athens, Greece)
10.30-11.00	<b>Discussion held by Rapporteur: Stefania Tonin</b> (University IUAV of Venice, Italy)
	11.00-11.15 <i>Coffee break</i>

11.15-11.45	<b>The determinants of Brownfields regeneration: An Analysis of Brownfields in England, George Hutchinson</b> (Queens University, Belfast, UK)
11.45-12.15	<b>Valuing the benefits of contaminated sites cleanup and reuse: results from a survey in Italy, Stefania Tonin</b> (University IUAV of Venice, Italy)
12.15-12.45	<b>Discussion held by Rapporteur: Stefania Tonin</b> (University IUAV of Venice, Italy)
	<i>12.45-13.45          Lunch</i>
13.45-16.45	<b>Session 2 Wider Impacts and community development</b>
13.45-14.15	<b>Dealing with residual contamination under "clean to use": National practices and potential roles for local communities, Peter Meyer</b> (University of Louisville, USA)
14.15-14.45	<b>Putting Contaminated Sites in their Place: A complex Adaptive Network Approach to Understanding the Brownfield Redevelopment Process, Joe Doak</b> (University of Reading, UK)
14.45-15.15	<b>Recycling Urban Industrial Land in China, Xin Li</b> (Massachusetts Institute of Technology, USA)
15.15-15.45	<b>Urbanisation process and environmental planning: Sustainable development strategies in mediterranean urban regions after urban sprawl, Francesc Munõz</b> (UAB, Spain)
15.45-16.15	<b>The Market for Brownfield sites in U.S. cities, Marie Howland</b> (University of Maryland, USA)
16.15-16.45	<b>Discussion held by Rapporteur: Francesco Musco</b> (University IUAV of Venice, Italy)
	<i>16.45-17.00          Coffee break</i>
17.00-18.30	<b>Session 3 The way forward: creation of a network on the valuation of Contaminated Site Reuse (ECOSIR)</b>
17.00-17.30	<b>Rapporteurs' summary of the three sections of the workshop</b>
	<b>Day one: Vania Paccagnan</b> (University IUAV of Venice, Italy)
	<b>Day two: Session one: Stefania Tonin</b> (University IUAV of Venice, Italy)
	<b>Day three: Session two: Francesco Musco</b> (University IUAV of Venice, Italy)
17.30-18.30	<b>Discussion with expression of interest on setting up the network by participants</b>
18.30	<b>Closing</b>