Work Package 6

Definition of a protocol for the Health Impact Assessment (HIA)

Action 1

Definition of a protocol for the Health Impact Assessment (HIA) in a population residing in an area characterized by the presence of a municipal waste incinerating plant

Executive Summary

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SUMMARY - ACTION 1

Introduction

Work package 6 (WP6) of the Moniter Project is mainly intended to outline HIA model Guidelines to be applied to the Waste Incinerating Plant or future combustion plant projects. In particular, Action 1, within the framework of WP6, is mainly designed to describe a methodology for the definition of an HIA model specifically developed for the implementation of a “Health Impact Assessment of the solid municipal waste incinerating plant on the population living in its surroundings”.

A retrospective impact assessment (application of a retrospective Rapid HIA) allows to collect the available knowledge through a literature review, focusing on the issue of waste incineration, and the consultation of local key information providers. This first application is intended to define the guidelines, the main thematic areas and the objectives to be pursued. Then the rapid simultaneous (or cross-cutting) application, involving Moniter WP collaborators, the institutional individuals and groups, benefits from the monitoring experience made in the Emilia-Romagna region and analyses the social and political context. In this case the concrete health improvement opportunities in the area under study and the guidelines for the description of HIA procedure in the area are taken into account. The general knowledge that has been gathered is at the basis of recommendations and guidelines for the prospective application to be developed in the future.

Methodological development for the definition of the model

The methodology that has been implemented for the selection and validation of methods and materials is described through three essential operational processes that allow:

- a national and international literature review to outline the state of the art on HIA. It is aimed at: 1) serving as a conceptual reference framework on priority issues for the development of an HIA model in populations exposed to Municipal Waste Incinerating Plants; 2) develop a synthesis of HIA materials and methods to be used in the specific context.

- Expert’s consultation through the administration of an ad hoc questionnaire aimed at building consensus on theoretical contents, methodological details and main prerequisites for an HIA on Waste Incinerating Plants. The recommendations that will be provided will serve as reference for the materials and methods of HIA applications that will be developed in the future.

- two pilot HIA applications are available in the area of Incinerating Plant that covers the Province of Bologna, followed by the validation of the final model by means of the Delphi methodology.

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1 HIA is the acronym that identifies the Health Impact Assessment procedure. In Italy the acronym VIS (Valutazione degli Impatti sulla Salute) is used.
A rapid form of HIA is applied in two different ways. In the first case, a retrospective Rapid HIA is applied through a “desktop appraisal”, i.e. a qualitative analysis of interactions between (social and natural) environment and health, which rapidly assesses the effects of actions carried out in the past and of changes in social relations (through the identification of the stakeholders concerned) and of the context (evolution and management of the incinerating plant, local strategic policies). The method consists in the consultation of existing documents and key information providers.

In the second case a simultaneous Rapid HIA is implemented as an experience of a “participatory approach” (participatory rapid appraisal) through which stakeholders can be involved. Evidence related to experience, knowledge and opinion of subjects living and operating at a local level during a workshop session. A joint health impact assessment and prioritization is made and recommendations are issued to decision-makers.

The experiences and results stemming from these activities can be summarized in a few critical bullet points from which a Delphi process can be started for the validation of a final HIA model and the formulation of use recommendations.

The general “communication” aspects that accompany all the processes that are described are analysed under Action 2, WP6.

Figure 1. General layout of the methodology in three main processes.

General Rapid HIA methodology

The “pilot” health impact assessment that has been carried out under Action 1 is not applied to a draft proposal since the incinerating plant on which assessment takes place already exists and no prospective HIA is used for to estimate future impact. HIA is used within the framework of the Monitor project to outline a picture including information
on: available evidence and knowledge on impact and relative priority, expected outcomes that have been implemented (or not) during the project, transformation of the social-environmental-health context due to the incinerating plant activities and possible changes occurring over time, accessibility and nature of key information, political decision-makers’ ability and propensity to adopt HIA at the local level. From this point of view, the practical application meets the specific objective pursued by Action 1 to develop recommendations on context-specific materials, methods and conditions that contribute to outline a final HIA model adjusted to the issue under study. In this methodological development process assessment and appraisal activities are carried out according to a typical general Rapid HIA model and recommendations are issued to decision-makers for impact reduction and health improvement purposes. Methodological recommendations are also provided for the HIA development, in compliance with the Action objectives. A few general conclusions on the validity of the HIA procedure applied to waste management and incineration are also reached to outline a reference framework for Action 3 - WP6.

Figure 2. General Rapid HIA methodology (adjusted from the “Merseyside model”).

**The implementation of Rapid HIA phases**

The document supporting the pilot study known as “Frullo Incinerating Plant – rapid retrospective application” has developed the following contents and phases:
- pilot study summary;
- applied HIA methodology description;
- context analysis with reference to the waste policy, the features of the incinerating plant, existing local participation tools;
• community profile and reference to the relative documentation;
• Evidence provided by available impact assessment studies in the area and reference to the relative documentation;
• Evidence coming from key information sources through the drafting of the attached checklists.

Furthermore, a participated workshop organized on the basis of the preliminary outcomes that have emerged and of the retrospective application, was intended to collect:
• Evidence provided by stakeholders through a consensus building process.

All the evidence and information that have been collected as above mentioned have then been analysed (based on the triangulation method) to identify and characterize the potential types of impact. This leads to a sum of results during the overall phase focusing on:
• The impact analysis.

**Impact analysis summary**

<table>
<thead>
<tr>
<th>Classification of identified health determinants:</th>
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<tbody>
<tr>
<td>• Urban environmental conditions</td>
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<tr>
<td>• Access to facilities and services</td>
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<tr>
<td>• Community and social influence</td>
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<tr>
<td>• Physical environmental conditions</td>
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<tr>
<td>• Economic environmental conditions</td>
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<tr>
<td>• Lifestyle</td>
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<tr>
<td>• Personal conditions</td>
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</table>

<table>
<thead>
<tr>
<th>Classification of project elements having the greatest effects on determinants:</th>
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<tbody>
<tr>
<td>• Transport network (public transport organization, connected infrastructures)</td>
</tr>
<tr>
<td>• Community development</td>
</tr>
<tr>
<td>• Land use, public participation</td>
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<tr>
<td>• Economic development</td>
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<tr>
<td>• Incinerating plant emissions</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>The building of an incinerating plant has effects on:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Population subgroups</td>
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<tr>
<td>• Young people (0-18)</td>
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<tr>
<td>• Residents and workers of the incinerating plant</td>
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<tr>
<td>• Chronically ill people, children and elderly people</td>
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<tr>
<td>• Rural population</td>
</tr>
</tbody>
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<table>
<thead>
<tr>
<th>Impact description:</th>
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<tbody>
<tr>
<td>- Business assessment</td>
</tr>
<tr>
<td>- Recreational and farmland are pushed back</td>
</tr>
<tr>
<td>- Higher risk perception</td>
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<td>- Cumulative exposure</td>
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<td>- Local traffic, noise</td>
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<tr>
<td>- Greater use of health services, of drugs</td>
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<tr>
<td>- Exodus from agricultural and animal farms</td>
</tr>
<tr>
<td>- dust/emission associated disorders</td>
</tr>
<tr>
<td>- Deterioration of landscape quality</td>
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<tr>
<td>- No architectural integration in the visual context</td>
</tr>
</tbody>
</table>
+ It enhances culture, awareness and knowledge of environmental issues and their links with health within the population at large
+ Participation
+ A part of the heat and electrical power has a positive impact on the population
+ Reduction in the number of landfills
+ Greater safety for the community thanks to more efficient waste disposal and street cleaning activities

Subjects and responsibilities:
- Local authority
- Control authority
- Management authority
- Associations
- Provincial authority
- Experts
- Technicians/researchers

Summary of recommendations for the improvement of actions and proposals for the waste management system.

Reference territorial context
- Proper identification of the ideal local reference context to implement a suitable waste management system that justifies the operational choices (development of an Incinerating Plant, other..)
- Adequate selection of suitable sites for the development of waste disposal plants

Participation, listening and communication
- Development of (serious, scientific, accurate and comprehensive) cultural activities and an adequate communication capacity based on listening to and catering for the expressed needs.
- Involvement of the community for the definition of adequate alternative solutions
- Analysis of perceived quality of life in the present communication
- Actions to dispel fears stemming from the presence of an Incinerating Plant (a few useful elements are the distortion of information, incomplete knowledge, lack of confidence towards communication providers)

Controls and monitoring
- Increase in the safety of the incinerating plant proportionate to the size of the plant itself
- Monitoring and assessment providing greater protection to the community
- Extension of controls in the area surrounding the incinerating plant
- Assessment of overall loads specifically related to traffic in the area.
- Development of overall control plans

Waste management system
- Definition of an approach that guarantees ethical choices by decision-makers to the benefit of the general wellbeing of the community.

Visual Impact
- Reduction of the visual impact, by harmonizing the presence of the incinerating plant in the environment.

Epidemiological Studies
- Health impact studies in the area characterized by the presence of the incinerating plant play an important role to make clear and transparent choices to the benefit of the community at large.
Conclusions and recommendations on the HIA methodology

Among the stakeholders that constitute the HIA process, the values underlying the health notion, the general values that characterize the use of HIA, the prerequisites and the reference regulations at the local level must be defined before implementing any procedures.

Hence, it can be stated that in order to build a HIA model suited to the specific proposal the following elements must be agreed upon before starting the process:

- the definition of the reference health notion underlying the HIA model,
- the detailed definition of HIA, by specifying objectives and interests involved,
- the prioritization of identified elements,
- the definition of the HIA output according to the different uses and targets.

Furthermore, it is necessary to describe the political-administrative structure of Public authorities involved in the HIA process (regional authority, provincial authority, municipality, USL – Local Health Authority, other local authorities), to clearly identify the different governance activities (in particular decisions and control actions) and the opportunities to include HIA in the decision-making toolbox for the promotion of health.

Before defining a HIA model, a few issues must be addressed.

A) legislative aspect – the choice of the procedure among all the available assessment tools depends on the interpretation and role assigned to the health impact analysis based on the HIA model by the various institutional levels involved.

B) knowledge aspect – wrong expectations and doubts by those who use HIA as a decision-support system for regional governance choices lead to underestimate the HIA potentials. A wrong judgement of the validity of the HIA procedure might stem from misunderstandings that lead to consider HIA as a bureaucratic burden or a technical formality that does not support the decision-making process.

C) methodological aspect - the positioning of the model among the methodological alternatives must foster the participation and involvement of all the stakeholders and must take into due account all the opinions and contributions of experts, as a source of knowledge to supplement the scientific evidence-based approach.

In summary, a reply must be given to the following question: why is it important to resort to the HIA? The answer cannot be given aprioristically but it must take into account a few critical points that have been identified.

The Delphi Policy: final model and recommendations

Eight experts have taken part in the Delphi Policy survey that has led to the definition of Health Impact Assessment (HIA) model to estimate the effects of the municipal waste Incinerating Plants that will be developed in the Emilia-Romagna region. The final model results from the analysis of contents included in the first questionnaire, approved by the second one and followed by recommendations stemming from the Swot analysis through the third questionnaire. The model is built on 6 analysis levels (listed here
below), characterized by 30 different issues and 175 stakeholders, classified according an order of importance and priority.

1. Social responsibility
2. Social and economic externalities
3. Information contents.
4. Reference values of the whole assessment process.
5. Professionalism and transparency.
6. Involvement and communication

Model description

The various phases of the model are described by means of a block diagram (figure 3). A few phases are standard as against the general HIA process and are coloured in blue. The innovative phases as against the general HIA process and specific to the Moniter project are coloured in green. After the attribution of denial fraction to the most suitable waste disposal techniques an extra assessment phase is added, concerning the destination of residual waste, in case the waste management strategy envisaged the use of the Incinerating Plant as a waste disposal technique. This phase is coloured in red. (The model does not enter in the details of this assessment). More specifically, as far as each phase of the process is concerned, the Delphi results have allowed to add a few specifications to the sub-specifications that refer to the six above-mentioned issues. A few indicators have been developed to describe how these specifications are implemented in each phase of the model (figure 4).

<table>
<thead>
<tr>
<th>Indicators refer to:</th>
<th>Indicators are related to:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. methodological details related to the described innovative processes</td>
<td>innovative aspect of the traditional – innovative model</td>
</tr>
<tr>
<td>2. participatory processes and involvement linked to the negotiation and decision-making aspects</td>
<td>⇨ possible controversy consensual – highly controversial</td>
</tr>
<tr>
<td>3. in-depth analysis to assure the effectiveness of the HIA process</td>
<td>⇨ fundamental for the correct conclusion marginal - fundamental</td>
</tr>
<tr>
<td>4. actions to be implemented and competencies required by macro-areas</td>
<td>⇨ necessary specific competencies non specialistic – highly specialistic</td>
</tr>
<tr>
<td>5. necessary consideration of local context conditions where the proposal is to be implemented</td>
<td>⇨ dependence on the system dependent - neutral</td>
</tr>
</tbody>
</table>

Finally, recommendations are issued for a better and proper implementation of the model in terms of: model resources, critical points and threats to be addressed (table 1).
Figure 3. Monitor Model. Block Diagram.

Waste management system analysis and definition of the competent area

New incinerator

Destination of residual waste?

NO

YES

Waste disposal through incineration

Screening *

Is HIA necessary and useful?

Scoping *

Conduct assessment *

Report on health impacts and policy options *

Monitoring*

Impact and outcome evaluation

Assessment of social and economic externalities

Futuring economic effects

Demographic Monitoring and employment

Effect Assessment

Conflict management

3 guiding principles:
- Allocation of the denial to alternative preferential waste management solutions
- Transparency

Analysis of on-site criticalities:
- Environmental
- Health
- Social
- Ecological

6 Analysis dimensions of the proposal:
- Social responsibility
- Social and economic externalities
- Information contents
- Reference values of the whole assessment process
- Professionalism and transparency
- Involvement and communication

* direct community involvement

Feed-back for the improvement of the assessment process
Figure 4. Process assessment for each phase of the Moniter model.
<table>
<thead>
<tr>
<th></th>
<th>Model Resources</th>
<th>Criticalities to be addressed</th>
<th>Threats for the proper implementation of the model</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>preliminary phase</strong></td>
<td>❑ ex-ante assessment of alternatives for a rational waste management</td>
<td>❑ Complexity of the population involvement process (a)</td>
<td>❑ National master plan for the location of incinerators</td>
</tr>
<tr>
<td></td>
<td>❑ ex-ante integrated assessment of criticalities in compliance with the planning and strategy of waste management and energy policies</td>
<td>❑ Evidence to be provided in case of a “do nothing” hypothesis</td>
<td>❑ Guidance to target groups for the choice of the suitable site</td>
</tr>
<tr>
<td></td>
<td>❑ analysis of the different population needs in view of conflict management</td>
<td>❑ Promotion of energy efficiency principles, recycling and rationalization in the use of the energy sources (b)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>❑ Control of programming and planning levels</td>
<td>❑ Indicators for a proper conflict management</td>
<td></td>
</tr>
<tr>
<td></td>
<td>❑ National master plan for the location of incinerators</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>❑ Guidance to target groups for the choice of the suitable site</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>screening phase</strong></td>
<td>❑ analysis of environmental, health, social and ecological criticalities in the macro areas affected by the impact</td>
<td>❑ Lengthening of development and assessment time schedule of the individual incinerating plant (c)</td>
<td>❑ Economic crisis and deterioration of the social climate;</td>
</tr>
<tr>
<td></td>
<td>❑ Identification of relevant variables for a multidisciplinary and multisectoral analysis</td>
<td>❑ Complexity of the population involvement process (a)</td>
<td>❑ Process failure due to a lack of agreement between the institutions and to a broad participation of stakeholders</td>
</tr>
<tr>
<td></td>
<td>❑ Complexity of a few issues to be addressed</td>
<td>❑ Complexity of a few issues to be addressed</td>
<td></td>
</tr>
<tr>
<td><strong>scoping phase</strong></td>
<td>❑ Setting up of a steering group including local authorities so that the whole process and results are not hindered.</td>
<td>❑ Flattening of the variables at stake to the exclusive advantage of health (e)</td>
<td>❑ Transformation of pressure factors of the main environmental matrixes and consequent unforeseen contamination</td>
</tr>
<tr>
<td></td>
<td>❑ Definition of process indicators that guarantee transparency concerning the estimated benefits, distribution equality and freedom of choice</td>
<td></td>
<td>❑ The alternative location assessment process is affected by vested interests.</td>
</tr>
<tr>
<td></td>
<td>❑ Setting up of the a HIA to supplement the EIA</td>
<td></td>
<td></td>
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<tr>
<td><strong>assessment phase</strong></td>
<td>❑ analysis of economic health in the area affected by the impact of the new incinerating plant</td>
<td>❑ Attention to the definition of indicators for the collection of information in view of an accurate impact assessment and monitoring</td>
<td>❑ Transformation of pressure factors of the main environmental matrixes and consequent unforeseen contamination</td>
</tr>
<tr>
<td></td>
<td>❑ Inclusion process of new evidence/knowledge for the definition of</td>
<td>❑ Relevance of the Environmental Costs Benefits Analysis</td>
<td>❑ The alternative location assessment process is affected by vested interests.</td>
</tr>
<tr>
<td>Model Resources</td>
<td>Criticalities to be addressed</td>
<td>Threats for the proper implementation of the model</td>
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<tr>
<td>project changes and recommendations</td>
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</table>
| recommendation and reporting phase | - Promotion of compensation forms in full respect of local needs  
- Development of useful indications for the choice of waste disposal and storage areas | - Genesis of unjustified scaremongering or possible underestimation following to misleading communication of the assessment outcomes to citizens | - Poor awareness by local authorities concerning the need to improve the waste storage system and citizens’ health protection |
| monitoring & evaluating phase | - Continuous environmental monitoring to assess the overall state of health of the area, in particular also after the project development | - Assessment of positive and negative feedback | |
| project and process aspects | - Need for remarkable economic resources for the implementation of the model and fund-raising difficulties  
- Uncertainty in the HIA results.  
- Allowing to change and adjust the model based on the “learning by doing” process  
- Complexity of a few issues to be addressed (d) | - Process failure due to a lack of agreement between the institutions and to a broad participation of stakeholders  
- The transparent and participated management is not turned into a best practice  
- Extreme positions become radicalized by limiting the process.  
- Negative relations between the partners and administrative and management complications hinder the process. | |

(a) This aspect might be regarded as excessively difficult or, if underestimated, it might lead to a whole set of problems in relation to the acceptance by the community resident in the area of the results that have been achieved by HIA;  
(b) In order to find alternatives to the development of the incinerating plant;  
(c) As a consequence several experts and stakeholders are involved;  
(d) Not all the issues can be addressed in depth due to the timing for the implementation of the model;  
(e) The assessment of the other components is carried out taking into account the health issue.