Sistema Nazionale per la Protezione dell'Ambiente

MANUALI E LINEE GUIDA

Guidelines for Integrated Environmental and Health Risk and Impact Assessment in environmental procedures (EIA,SEA and IEP under EU IPPC Directive): *SUMMARY REPORT*

133 bis/2016

SUMMARY REPORT

of the

THE ITALIAN NATIONAL "VIIAS" GUIDELINES FOR INTEGRATED ENVIRONMENTAL AND HEALTH RISK AND IMPACT ASSESSMENT IN ENVIRONMENTAL PROCEDURES (EIA, SEA and IEP under EU IPPC DIRECTIVE)

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by

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Introduction

Why and who will need the "VIIAS" Guidelines

The VIIAS Guidelines were developed to be discussed and applied mainly in Italy. However in this Report we like to share key issues of our experience being aware that, apart from single project or initiative, still in many Countries the approach (and the governance of) including "health" in environmental procedures on daily basis still need further improvement. Many open issues are yet to be clarified but we hope that our efforts could provide a basis for future activities in Italy, but also for the implementation of the same process in other Countries according to their legislation. Indeed ensuring that the environmental health implications of the decision-making arena are taken into account before the decisions are made could be still a challenge for several reasons, such as lack of familiarity of researchers with local mechanisms for decision-making or, vice versa, lack of familiarity with environmental health approach for other sector operators involved in decision making process. This may have some implications in the process of approval or authorization regarding plans, programs, projects and industrial installations currently regulated in the EU, respectively, through Directives on Environmental Assessment (EIA, SEA) and IPPC. Furthermore there is a growing awareness among professionals and stakeholders that legally enforced environmental thresholds of pollutants need to be better integrated by ad hoc health risk and impact assessment approach, both in proposal design and in the authorization procedures, in order to facilitate also a more transparent communication to concerned population. However although health issues are explicitly requested in some EU environmental procedures such as EIA, still there is a need of facilitating mechanisms aimed to provide private and public operators, data and methodological tools to support an Integrated Environmental and Health Risk and Impact Assessment within the entire process. The Guidelines were intended to be a first contribution to the operational needs of those that are active players in Environmental Impact Assessment (EIA), Strategic Environmental Assessment (SEA) and Integrated Environmental Permitting (IEP) procedures in the framework of EU Integrated Pollution Prevention and Control (IPPC) Directive (see BOX 1). The ultimate aim was to promote integration of health issues in the daily work of those called to propose or evaluate new plans, programs and projects and environmental performance of industrial installation, as well, for operators involved in the authorization process under the permitting framework of IPPC Directive. The privileged audience of Italian Guidelines is Environmental Protection Agencies System (SNPA) staff experts, along with the operators of the Public Health Services, involved in environmental authorizations. Main technical goal was to provide them with a methodological tool to be used for an integrated assessment of the potential health impacts of environmental determinants, according to different environmental procedures settings, based on similar experiences carried out abroad and currently going on in some Italian regions. The ultimate aim was to foster a forum of discussion on a possible common approach and assessment pathway that will include every operator, meaningless their background, involved in such procedures at local level, so promoting a better integration with environmental health experts and, also, coherence among different settings of regulated environmental assessment procedures. So far such integration goals have been minimal in many Countries and not always methodologically sound. Indeed, one of the major objectives of these guidelines is also to foster a scientifically sound discussion between all the stakeholders, public and private ones. However improved methodologies and assessment tools will facilitate this process, together with increasing awareness among policymakers and adoption of *ad hoc* legislation. With this in mind, this brief report will summarize the process and the background of guidance development, the regulatory framework and, at last but not least, the methodological issues extensively approached in the original Italian version whose complete index and list of contributing authors are listed in Annex.

BOX 1

EU EIA, SEA and IPPC Directives

The EIA Directive of 1985 has been amended several times, these amendments have been codified by Directive 2011/92/EU of 13 December 2011 and DIRECTIVE 2014/52/EU. The EIA Directive covers a broad range of activities ranging from industrial to infrastructure public and private projects which are defined in Annexes I and II. According to the project proposals EIA can be mandatory or up to Member States decision. Mandatory EIA regards all projects listed in Annex I are considered as having significant effects on the environment and require an EIA (e.g. long-distance railway lines, motorways and express roads, airports with a basic runway length ≥ 2100 m, installations for the disposal of hazardous waste, installations for the disposal of non-hazardous waste > 100 tonnes/day, waste water treatment plants > 150.000 p.e.). Discretion of Member States (screening) is for projects listed in Annex II, the national authorities have to decide whether an EIA is needed. This is done by the "screening procedure", which determines the effects of projects on the basis of thresholds/criteria or a case by case examination. However, the national authorities must take into account the criteria laid down in Annex III. The projects listed in Annex II are in general those not included in Annex I (railways, roads waste disposal installations, waste water treatment plants), but also other types such as urban development projects, flood-relief works, changes of Annex I and II existing projects).

The SEA Directive applies to a wide range of public plans and programmes is mandatory for plans/programmes which are prepared for agriculture, forestry, fisheries, energy, industry, transport, waste/ water management, telecommunications, tourism, town & country planning or land use and which set the framework for future development consent of projects listed in the EIA Directive or have been determined to require an assessment under the EU Habitats Directive. For the plans/programmes not included above, the Member States have to carry out a screening procedure to determine whether the plans/programmes are likely to have significant environmental effects. If there are significant effects, an SEA is needed. Under the SEA Member States must monitor the significant environmental effects of the implementation of plans/programmes in order to identify unforeseen adverse effects and undertake appropriate remedial action. The SEA and EIA procedures are very similar, but there are some differences:

- the SEA requires the environmental authorities to be consulted at the screening stage;
- scoping (i.e. the stage of the SEA process that determines the content and extent of the matters to be covered in the SEA report to be submitted to a competent authority) is obligatory under the SEA;
- the SEA requires an assessment of reasonable alternatives (under the EIA the developer chooses the alternatives to be studied).

The IPPC Directive is about minimizing pollution from various industrial sources throughout the European Union. Operators of industrial installations operating activities covered by Annex I of the IPPC Directive are required to obtain an environmental permit from the authorities in the EU countries. About 52.000 installations are covered by the IPPC Directive. The IPPC Directive focuses on the environmental impact of the operation of new and existing installations. It does not cover infrastructure projects. Thresholds for installations sometimes differ from those used in the EIA Directive. The control of emissions to air, water and soil is complemented by provisions concerning energy use, waste flows and accident prevention. Installations under this Directive need an integrated permit and are subject to ongoing monitoring and updating of the permit conditions. The IPPC Directive is based on several principles, namely an integrated approach, (2) best available techniques, (3) flexibility and (4) public participation. The integrated approach means that the permits must take into account the whole environmental performance of the plant, covering e.g. emissions to air, water and land, generation of waste, use of raw materials, energy efficiency, noise, prevention of accidents, and restoration of the site upon closure. The purpose of the Directive is to ensure a high level of protection of the environment taken as a whole. The permit conditions including emission limit values (ELVs) must be based on *Best Available Techniques* (*BAT*), as defined in the IPPC Directive. To assist the licensing authorities and companies to determine BAT, the Commission organizes an exchange of information between experts from the EU Member States, industry and environmental organizations. The principle of flexibility is expressed by allowing the licensing authorities, in determining permit conditions, to take into account the technical characteristics of the installation, its geographical location and the local environmental conditions. The Directive ensures that the public has a right to participate in the decision making process, and to be informed of its consequences. The EU and Italian regulations regarding transposition of EU Directive are summarized below

Source: EU Commission adapted by L.Sinisi, ISPRA

About the Italian "VIIAS" Guidelines

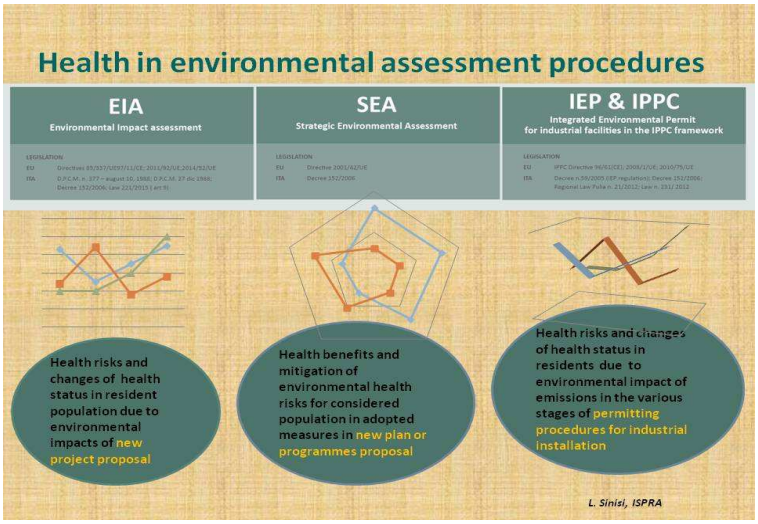
The Guidelines are the result of knowledge and experiences developed over the years by the environment and health expert group of the Italian National System of Environmental Protection Agencies (SNPA) which contribute to the Guidelines development.[1] The authors intended to launch a first contribution to the practical needs of people that, at different level of responsibility and as requested by current EU Directives and their transposition in national and regional laws, operate within the procedures of the EU Environmental Impact Assessment (EIA), Environmental Strategic Assessment (ESA) and Integrated environmental permit/authorization (IEP) in the framework of EU Integrated Pollution Prevention and Control EU Directive (IPPC) (**Box 1)**. Main goal of the Guidelines was the integration of the Health Impact Assessment (HIA) within and according to the timing and goals of the different current environmental procedures, thus allowing the Integrated Assessment of Environmental and Health Impacts or **VIIAS** (**V**alutazione **I**ntegrata di **I**mpatto **A**mbientale e **S**anitario).

a) The definition of VIIAS and current EU environmental procedures

The EU Directives on Environmental Assessment are inspired by the common principle of ensuring that plans, programs and projects likely to have significant effects on the environment are made subject to an environmental assessment, prior to their approval or authorization. In principle these assessments include also, through different procedures, evaluation of potential risk to the health of involved population. Regarding health impact assessment (HIA) the most quoted definition in Europe is the one proposed in 1999 by WHO Regional Office for Europe which defines HIA as a "*A combination of procedures, methods and tools by which a policy, programme or project may be judged as to its potential effects on the health of a population, and the distribution of those effects within the population".*

In the framework of HIA definition we introduce the **concept of VIIAS**, that is "*a combination of procedures, methodologies and tools that allows the assessment of potential health effects and the distribution of those effects within the population in the framework of current environmental assessment procedures*".

The evaluation of health issues will follow common assessment pathways but it has also to cope with the different queries according to specific environmental law. This will require specific knowledge, if not familiarity, with the legal context and the several procedures that are set up at local level and, last but not least, the timing of these procedures.



[1] Authors of the original Italian Guidelines text are listed in the Annex

The Guidelines identify the criteria needed to implement the routine activities of EIA, SEA and IPPC according to the current regulations: specific sessions about Italian legislation and regulations background, where VIIAS will take place are included in the text , as well as practical examples (including some study cases) coming from the real field experience of some Authors. In order to facilitate the readers, the guidelines and its "health" approach are subdivided in separate chapter according to environmental settings (EIA, SEA, IPPC permit). For a more detailed organization of chapters and paragraph we recommend to refer to the index of original Italian Guidelines listed in the Annex of this Report.

b) The background of VIIAS development in Italy

Worldwide the increase of citizen concern for environmental risks is requiring a better understanding of health-related issues and a sound strategy focused on collective interests, quite challenging queries when related at complex environmental settings. In spite of such limitations, environmental managers are bound to take into consideration the involvement of local community into the decision-making process related to environmental issues.

In Italy, looking at the quite uneven decision making system in national, regional and local level there was a need for a shared methodology for VIIAS, supported also by more recent developments in the knowledge of assessment methodology and tools. In the experience of Environmental Agency System experts health issues could be not addressed in a proper way and, sometimes, were definitely overlooked. For instance in ISPRA study reported in the Italian original report (see Appendix 4) concerning 109 project proposals of national interest to be submitted for EIA evaluation, a focused chapter on health issues was found in about 70% of the proposals, but pertaining information were somehow inadequate to fully address the topics, both from the qualitative and the quantitative point of view, requiring further information and/or monitoring from authorization authorities.

At the same time we had experienced somehow critical situations about health issues within the context of formal procedures of authorizations of new plans, projects, industrial plants or their revisions, due to growing concern of local communities over health-related matters in EIA SEA and IEP procedures. For example the very active groups of citizens against the construction of the high speed railway infrastructure in Val di Susa ,Piedmont Region (so called *antiTAV* committee) or the persistent protests about health risks and impacts from emissions of ILVA industrial plant in Taranto, the largest integrated steel plant in Europe.

Policy makers somehow acted in response to both researcher and citizen demands and many law initiatives were launched both at national and local level.

The case of ILVA, and its IPPC permit, required further regulations both at regional and national level. For the latter it was established by law the need of ad hoc HIA and, for all the so-called plants having strategic national interest, it was given mandate to the Ministry of Health to formulate guidelines for the risk and health assessment of resident population in those areas (Law n.231 /2012). Guidelines were approved by Decree of Ministry of Health in April 2013. This represented a turning point for VIIAS implementation at national level, even if it was related only to specific industrial plants. At local level the Apulia Region approved the law n.21 (July 24, 2012) regarding "*Rules to promote health, environment and territory from the industrial emissions in the Apulian areas already labeled as areas at elevated environmental risk*". Both national and regional laws imply interventions after the environmental permit has been released, aiming at monitoring specific impacts of the industrial emissions on public health, i.e, on the basis of the results of the health damage assessment a risk management plan is required in the areas

for which the health impact has been proven, including the revision of IPPC permit in order to accelerate the environmental recovery.

At regional level the standardization of procedures to include health issues within EIA procedures required further regulation also for defining the competent authority for the process: the Marche Region with the Regional Law n.1 of January 15, 2015, concerning "*Changes in the regional law March 26 2012, n,3 "Regional regulation of environmental impact (EIA)*" requires that each local public authority include HIA in the EIA process and the regional Environmental Agency is actively participating to its implementation.

Similarly in 2014, the Lombardy Region approved with D.G.R.n.1266 January 24, 2014, the Guidelines to be followed for public health issues to be dealt with in Environmental Impact Study (SIA) in EIA procedures.

Again at the end of 2015 within the context of the so-called law "Unblock-Italy" entry into force a new law (Law n. 221,28 dec. 2015- "Environmental rules to promote green economy and reduce the excess use of natural resources") regarding "Green Economy" measures that established as mandatory the VIIAS within EIA for projects concerning large energy production industrial installation (e.g. thermal plants and other combustion plants with thermal power above 300MW , oil refineries).

Also in the National Prevention Plan delivered by the Ministry of Health on November 13 2014 it is underlined that "the need to improve the preventive assessments of public health officers and to strengthen the health assessment in the EIA and SEA procedures" (Macro objective n.2.8).

Recently, in June 2016, it came to end the project "Tools for HIA-t4HIA" supported by the Center for Disease Control (CCM) of Ministry of Health and chaired by the Region Emilia-Romagna, which represents the last step of a process started in 2007 with the project "Monitoring of Incinerators in Emilia-Romagna, Moniter Project" and thereafter continued through 2010 with the project "Health Impact Assessment for Public Administrations-VISPA". The general objective of the t4HIA project the definition of a guideline for Health Impact Assessment, containing criteria, methods, tools and checklist both for assessors and for plant managers. Our VIIAS Guidelines were included as the main reference of the adopted HIA Guidance.

What is now lacking, in terms of specific procedures by law, is the extension of methods and tools to non-strategic IPPC permits and to the other authorization processes indicated in the Italian environmental framework law (Law 152/2006), but even so current EIA and SEA regulations provide basis for VIIAS implementation.

c) METHODOLOGICAL APPROACHES FOR INTEGRATED ENVIRONMENT AND HEALTH IMPACT ASSESSMENT

The indications reported in this paragraph are related to the application of VIIAS methodology in EIA where chemical toxic and carcinogenic effects have to be addressed. Such methodology can be extended to other procedures, such as ESA or IPPC permits.

It's largely agreed among researchers worldwide that there are two different approaches to assess health impact.

The first one, more typical of toxicology experts, is based on the principles of risk assessment, the second one, followed mostly by epidemiologists, is based on the quantification of attributable cases (Health Impact Assessment-HIA) (and also Years of Life Lost –YoLL and Disability Adjusted Life Years-DALYs).

These methods share similar assessment phases, but follow diverse background and different concepts and formulas, leading to quantitative results somehow different. The proposal of a common integration of the two procedures are largely discussed in Appendix 1 of original Italian text. In this paragraph we just summarize the basics of the two methods as adopted in our Guidelines.

- ***Risk Assessment Method (RA)***

Human Health Risk Assessment, as defined in the Red Book of the National Research Council is a procedure, which, by definition, is subdivided into four phases:

1) Hazard Identification
2) Dose-Response Assessment
3) Exposure Assessment
4) Risk Characterization.

The term "Risk Assessment" means an estimate of consequences on human health of potentially dangerous events, in terms of probability that such consequences may occur. The concept of risk implies the presence of a source of hazard which may result in damage.

As a matter of fact, RA is technical-scientific process that, connecting toxicological and/or epidemiologic data with estimated exposure levels, allows to quantify the risk related to exposure to toxic /carcinogenic substances.

Through a specific process, it is possible to estimate quantitatively a specific risk (R), resulting from the product of the exposure (E) and the specific toxicity of the substance (T).

$$R=ExT$$

The assessment of E results from the estimate of daily intake dose (Average Daily Dose ADD for non-carcinogenic and Lifetime Average Daily Dose LADD for carcinogenic substances, doses which are absorbed by human receptors. E.g. for inhalation absorption,

$$E=C(\text{Air concentration})X\ EM(\text{effective exposure input})$$

Where C (air) is the air concentration of the specific pollutant (mg/m2) and EM is the estimate daily amount of inhaled air by weight, which may estimated by

$$EM[\text{square meters}/(\text{Kg} \times \text{days}) = Bi \times EFg \times EF \times ED / (BW \times AT \times 365)$$

Where

Bi=Inhalation rate (cubic meters/hour)

EFg= daily exposure frequency (hours /day)

EF= annual exposure frequency (days/year)

ED= duration of exposure (years)

BW=body weight

AT= average exposure time (years)

The exposure factors useful to compute EM, together with their measurement units and the specific values, specific by receptor type and age class, can be derived from the handbook "Methodological criteria for the application of the absolute risk assessment in contaminated sites" (APAT,2008).

In the human health risk assessment, the average daily dose should be evaluated for each absorption route (inhalation, ingestion, percutaneous) and by specific human receptor (adults, children, industrial workers). Usually, the inhalatory route of absorption is considered at top priority for EIA evaluations. Likewise, only the residential exposure is taken into account.

As mentioned before, in RA the exposure estimate is followed by the risk characterization, a process which includes both the average daily dose and the toxicological pattern of the specific pollutant.

Hence, carcinogenic risk is determined by the formula:

$$R = LADD \times CSF$$

Where

R= risk or ELCR (Estimated Lifetime Cancer Risk) expressed as the increased probability of developing cancer during lifetime as a result of the specific exposure to a given carcinogen,

LADD=Lifetime Averge Daily Dose (mg/kg per day)

CSF=Cancer Slope Factor, indicates the carcinogenic potency of each pollutant and is the slope of the dose-response curve.

For inhalatory risk, in the literature there are so-called inhalation unit risk (UR or IUR) which can be directly applied to the air concentrations, resulting in risk assessment defined as

$$R = C(air) \times IUR$$

It is possible to convert CSF to IUR by $CS(inhal) = IUR \times (70\ kg / 20 m^3/day)$.

For non carcinogenic substances, risk is determined by the following formula:

$$HQ = ADD / RfD(inhal)$$

where

HQ=Hazard Quotient indicates how much the specific exposure exceeds the inhalatory reference dose (RfD),

ADD=Average Daily Dose (mg/kg/day)

RfD=Inhalation Reference Dose is the estimate of the maximal amount of substance which can be inhaled daily for all the lifetime without adverse health effects

Both for R and for HQ the additive rule holds, i.e. risk due to exposure to a mix of pollutants must be added up.

To determine non-carcinogenic risk due to multiple exposures and/or different absorption routes, individual HQ must be summed up in order to obtain HI, the Hazard Index.(USEPA 1991).

Risk assessment ends comparing the estimated risk with the threshold of acceptable risk. For non-carcinogenic substances, the threshold is fixed at HI=1, where values larger than 1 indicates excess risk. - For carcinogenic substances, USEPA suggest a “de minimis” value of 1x10-5 with mandatory interventions at R>1x10-4.

- **Health Impact Assessment Method (HIA)**

The basic four steps of RA are followed also in HIA, with some modifications,

1) Hazard Identification, same as in RA.
2) Dose-Response Assessment based on exposure-response assessment (incidence)
3) Exposure Assessment, based on measured data or estimates of exposure concentrations or, if not available, using proxy, sometimes based on interviews, logs or questionnaires)
4) Risk Characterization. The common indicators of association between variables exposure related and variables outcome-related are drawn from classical epidemiological studies (cohort, case-control, historical or “temporal” series, etc.) and usually are the Relative Risk (RR), the Odds Ratio (OR) and the Attributable Risk (RA). One of the most common indicators is the population attributable risk (PAR) useful to define the health impact on the population, expressing the number of additional cases occurred in the population attributable to the exposure, i.e. cases that would not have occurred without the specific exposure

In summary, the results of the epidemiological studies provide an estimate of the Relative Risk (RR) of developing a health outcome (death, hospitalization) for the exposed subset compared to the non-exposed subset. RR can be determined on a qualitative basis (presence or absence of exposure) or on a quantitative basis, comparing different gradients of exposure.

As mentioned before, different study designs can be applied, retrospective or prospective.

In the design of HIA, the following issues are to be addressed.

a) The value of the RR for the studied health effect, derived from the concentration-response function reported in the literature

b) The exposure values of the population under study, more specifically 1) the difference between the actual exposure and the reference one (counterfactual scenario) 2) the estimated increased exposure (calculated through measurements or models) due to new emission sources
c) The size of reference population of the baseline incidence data and the estimated population exposed to in new emission sources.
d) Baseline value of the health event in the reference population (morbidity or mortality).

The combination of the above mentioned data leads to the estimation of the fraction of attributable cases in a given population at a given exposure, i.e.

$$AD=A*B+deltaC*P(exp)$$

Where:

AC=number of cases attributable to the exposure under study

A=RR-1, where RR is the Relative Risk for each unitary increase of the pollutant (provided by the literature)

B is the backgound incidence, in absence of the exposure of interest

Delta C is the difference in environmental concentrations, of interest in the study

P exp is the exposed population.

AC is the number of cases attributable to the increased pollutant air concentration compared to the counterfactual (retrospective design) or to the measured concentrations in ares not affected by the specific source. It is important to assess Lower and Upper Bound Confidence Intervals around AC

Finally, as mentioned already, Guidelines hosted several paragraphs dedicated to this methodology discussion; for any enquire you may contact main authors at the following mail address: Andrea Ranzi- aranzi@arpae.it, Marco Baldini - marco.baldini@ambiente.marche.it.

e) The process in Guidelines development: *behind and beyond*

Generally speaking, the development of guidances that are related to some regulation in place follows a top- down approach: policy makers enroll experts to facilitate law implementation that has very strict connection with science. In the case of Italian Guidelines the approach was somehow bottom-up.

The Guidelines authors are E&H experts personally involved in dealing on daily basis not only with environment and health research projects and knowledge, but also with the (challenging) coping of the governance of environment and health topics, being permanent staff of the local (regional agencies) or national (ISPRA) environmental scientific authority, providing ad hoc support to public health services and decision making authorities (regional and national government). They represent the environment and health expert group of the environmental agencies system and, besides contributing to the document, in those years they urged and stimulate the entire agency system on the topic facing internal rules, consultation and discussion.

The process of guidelines development, along with scientific discussions with other experts and health institutions, included a preventive endorsement of two years work programme by Federal Council of Environmental Agencies SNPA as presented by appointed environment and health expert group. The Guidelines were formally approved in April 2015 by the same Federal Council, before their publication in the beginning of 2016.

In Italy, as already mentioned in this Report, in more recent years and in parallel to guidelines development, ad hoc regulations on the issue of *health in environmental assessment procedures* were approved both at national and local level. The process is definitely at the beginning and many issues are lying upon the table of researchers and policy makers, but Guideline development allows the SNPA to be part of this process, as representative of a networked System, not as singular expert.

And further activities already took place.

After the publication VIIAS Guidelines were included as the main reference of the HIA Guidance developed in the framework of the Italian Ministry of Health project, published in June 2016, aimed to support implementation of HIA procedures in specific project proposals as requested by Italian law entered into force in 2016. Guidelines were also the opportunity to focus on technical issues that are still under debate and development such as cumulative risk assessment implementation. This provides the background to develop the 2014 -2016 work programme of E&H expert group of SNPA which included a review of available experience on cumulative risk assessment procedures, a training course for environmental operators on integrated RA and a special review on the inclusion of indoor air exposure in health risk assessment.

Many other issues such as the availability of adequate supporting assessment data needs are under discussion and in the next SNPA work programme, and we are considering to update Guidelines with results of these activities and to start building larger consensus with involved stakeholders.

ANNEX

Italian VIIAS Guidelines:

a) List of authors

b) Index

c) Reference for citation

d) Reference of main authors

a) List of Authors

This document was written within the activities included in the Triennial Program 2010-2012, Area 8, of National System of the Environmental Protection Agencies by the Interagency working group "Health and Environment" coordinated by Giorgio Assennato, General Director of Arpa Puglia.

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b) GUIDELINES INDEX

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- 4.6 Analysis of basic sources of environmental, social and health data
- 4.7 Choice of the Response-concentration functions for air pollutants
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ANNEX

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2. Evaluation of impacts at the large steel plant at Taranto
3. The Brindisi case-study: Non-carcinogenic risk due to landfill emissions

APPENDIX 3.

Health Impact Analysis in the EIA according to the criteria in the decree December 27 1988

APPENDIX 4.

Health assessment in the EIAs and SEAs of national interest: the ISPRA experience

c) Reference for citation:

LINEE GUIDA PER LA VALUTAZIONE INTEGRATA DI IMPATTO AMBIENTALE E SANITARIO (VIIAS) NELLE PROCEDURE DI AUTORIZZAZIONE AMBIENTALE (VAS, VIA, AIA)

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