

ESRAs: a detailed overview

Introduction

The new FSC Pesticide Policy takes a far stronger stance with regards to minimising pesticide usage than any of the previous versions:

“The organisation shall use IPM and silviculture systems which avoid, or aim at eliminating, the use of chemical pesticides. The Organisation shall not use any chemical pesticides prohibited by FSC policy when pesticides are used, the organisation shall prevent, mitigate and or repair damage to environmental values and human health.” [FSC-POL-30-001 V3-0 EN](#)

FSC do however recognise that in certain circumstances, and after having considered other available pest management strategies, the use of chemical pesticides may be the only feasible way of controlling the pest problem.

The new policy brings a marked change in the way chemical pesticides are evaluated, placing the emphasis on risk rather than hazard (toxicity).

As the South African forestry sector, this is something we have pushed for, as the impact chemical pesticides on the environment or human health is as a result of a risk (hazard and exposure) being realised and not as a result of their inherent properties (hazard alone).

Moving to a risk-based approach ensures potential hazards are not viewed in isolation, but rather consider the context and the likelihood of that hazard being realised. It does mean that at an international, national and local level environmental and social risk assessments (ESRAs) will need to be conducted.

What is an ESRA

“A process to predict, assess and review the likely or actual environmental and social effects of a well-defined action, evaluate alternatives, and design appropriate mitigation, management and monitoring measures. In the context of the Forest Stewardship Council® (FSC®) Pesticide Policy, it relates to chemical pesticide use.” – [FSC-POL-30-001 V3-0 EN](#)

The new FSC pesticide policy requires ESRAs to be conducted – at a national, regional and management unit scale – before the application of any chemical pesticide. In doing so, ESRAs have become integral to FSC’s Integrated Pest Management (IPM) strategies and are a fundamental requirement for any FSC certificate holder wishing to use chemical pest management options.

Integrated Pest Management



The fundamentals of the ESRA concept proposed by FSC, as illustrated in the above diagram, are not dissimilar to the current IPM approach adopted by the South African forestry industry. There are however some distinct differences.

Conducting an ESRA

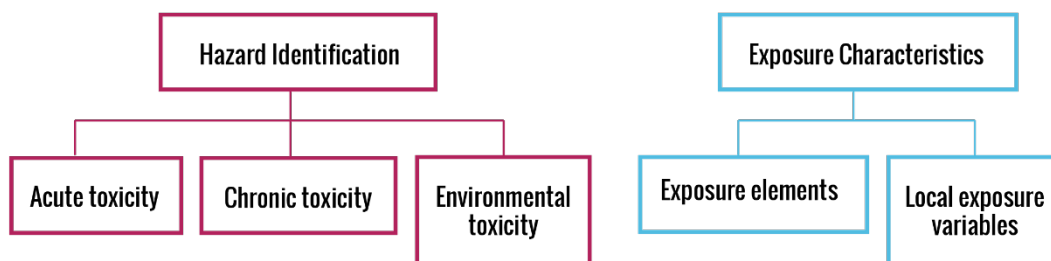
There are six basic principles that guide ESRA and their implementation:

1. The assessment is risk-based, thus:
 1. The prioritisation of criteria and categorisation of Highly Hazardous Pesticides (HHPs) results in the prohibition or restriction of their use according to the risk they pose to human health and the environment. Risk in this context being a function of the toxicity (hazard posed), which is both a global constant and the local exposure.

2. In certain instances, a more hazardous alternative may present a lower social and environmental risk than a less hazardous option.
2. An ESRA shall be undertaken by different stakeholders at international, national and management unit levels to identify:
 1. Lower risk alternatives.
 2. Conditions for chemical pesticide use.
 3. Adequate mitigation and monitoring measures.
3. As risk increases, efforts to reduce or mitigate risk shall also increase.
4. Under the same conditions of effectiveness and risk, the less hazardous pest management alternative shall be selected.
5. FSC considers the risks associated with using FSC prohibited HHPs to be unacceptable due to their high toxicity even at low exposures.
6. If a chemical pesticide is not included in the FSC list of HHPs, it does not mean that it is deemed safe. Before using a chemical pesticide not listed in the FSC list of HHPs, the certificate holder shall undertake an ESRA.

Placing the emphasis on risk

Understanding the elements of risk considered in the ESRA is crucial when evaluating a pesticide:



Understanding the innate hazards

The first step in a risk assessment is to identify the type and nature of the adverse effects associated with chemical pesticide use. Information sources used by FSC are listed in the FSC [Pesticide Policy](#). Once the hazards are identified, proper measures can be taken to eliminate them.

A pesticide is considered ‘highly hazardous’ if it contains any active ingredient that is:

- ‘Extremely hazardous’ (Class 1a) or ‘highly hazardous’ (class 1b) according to the World Health Organisation (WHO) recommended classifications of pesticides by hazard.

- Acutely toxic for rats and birds: acute oral LD50 for rats/birds $\leq 200\text{mg/kg}$ body weight (or most sensitive mammal/bird).
- Fatal if inhaled (H330 according to the Globally Harmonized System of Classification and Labelling of Chemicals (GHS) as classified by national/international authorities.

A pesticide is considered ‘highly hazardous’ if it contains any active ingredient that is in any of the following categories by classification systems:

- Group 1: ‘The agent (mixture) is carcinogen to humans’ or Group 2A: ‘The agent (mixture) is probably carcinogenic to humans’, according to the International Agency for Research on Cancer (IARC).
- Group A (Carcinogens to Humans) (1986 Guidelines) or Group B (Probably Carcinogenic to Humans) (1986 Guidelines) or Known/Likely human carcinogen (1996 Guidelines) or Carcinogenic to humans (1999 and 2005 Guidelines-current) or Likely to be carcinogenic to humans (1999 or 2005 Guidelines – current), according to the US Environmental Protection Agency (EPA) Carcinogenicity Classification.
- Category 1A (Known to have carcinogenic potential for humans) or category 1B (Presumed to have carcinogenic potential for humans), as classified by National/International authorities according to classification for carcinogens of the GHS.

A pesticide is considered ‘highly hazardous’ if it contains any active ingredient that is in any of the following categories:

- Category 1A (substances known to induce heritable mutation in germ cells of humans) or Category 1B (substances which should be regarded as if they induce heritable mutations in the germ cells of humans), as classified by national/international authorities according to the classification for mutagenicity of the GHS.

A pesticide is considered ‘highly hazardous’ if it contains any active ingredient that is in any of the following categories:

- Category 1A (known human reproductive toxicant) or Category 1B (presumed human reproductive toxicant), as classified by national/international authorities according to the classification for reproductive toxicants of the GHS.

A pesticide is considered ‘highly hazardous’ if it contains any active ingredient that is classified as:

- Category 1 (substances for which endocrine activity have been documented in at least one study of a living organism) according to the EU list of potential

endocrine disrupters.

- Category 2 (suspected human carcinogens) of the classification for carcinogens of the GHS and Category 2 (suspected human reproductive toxicants) of the classification for reproductive toxicants of the GHS.

A pesticide is considered 'highly hazardous' if it contains any active ingredient that:

- Has aquatic toxicity LC50/EC50 <50 µg/l, using Daphnia as the test organism or other invertebrate or vertebrate aquatic organisms that show greater sensitivity than Daphnia. Acute test duration up to 96 hours.

A pesticide is considered 'highly hazardous' if it contains any active ingredient that is considered:

- Persistent (DT50>90 days), combined with
- Low soil sorption coefficient (Kco <300ml/g), and/or
- High water solubility (> 30mg/l).

It has the potential to accumulate in animal/human tissue:

- Bio-concentration factor (BCF) for the active ingredient is ≥1000, or
- Octanol-water partition coefficient (KOW) for the active ingredient >1000 u.e. logP (KOW) >3
- **NOTE:** BCF data shall supersede the logP(KOW) data.

A pesticide is considered 'highly hazardous' if:

- It is contaminated with any dioxins at a level of 10 part per trillion (corresponding to 10 ng/kg) or greater of tetrachlorodibenzo-pdioxin (TCDD) equivalent (TEQ), or it produces such an amount of dioxin(s) released when burned.

A pesticide is considered 'highly hazardous' if it contains any of the following heavy metals as active ingredient, inert or known impurity:

- Lead (Pb)
- Cadmium (Cd)
- Arsenic (As)
- Mercury (Hg)

[Understanding the exposure characteristics](#)

Once the hazards have been identified, the second step is to conduct the exposure characterisation which analyses how different values are affected by chemical pesticide use. The exposure characteristics consider:

1. Environmental and social values that can be affected by exposure to chemical pesticides.
2. Exposure variables that influence the level of exposure.

These are the types of values that may be negatively affected by chemical pesticide use and are listed in [Annex Two FSC-POL-30-001 v3-0 En.](#)

Multi-level ESRA approach

ESRAs will be conducted on three levels:

1. **Internationally** – To identify and categories HHPs; provide the minimum requirements for ESRA; and develop International Generic Indicators (IGI) for use and risk management of HHPs. This will be the responsibility of **FSC** to provide a control framework that will ensure consistency in the development of national indicators by Standard Development Group (SDG). For countries with no SDG, international IGIs will be the indicators used.
2. **Nationally** – To identify highly restricted and restricted HHPs used or likely to be used in the country; conduct an overall risk assessment to identify and assess their risks; determine whether a highly restricted or restricted may be used; develop national indicators based on international IGIs; and the production of a country specific ESRA template. This will be done by the **national SDG**. It will be the SDG's responsibility to provide a list of highly restricted and restricted HHPs which can be used in South Africa, the conditions of use and an ESRA template to aid certificate holders.
3. **Management unit** – as part of an IPM strategy, a risk assessment at a management unit level must be conducted. The ESRA can be used, unless it can be demonstrated that ESRA requirements have been followed should other systems be in place to meet the ESRA requirements. It should be noted that, under similar conditions, management unit ESRAs may be transferable at a national level. At a management unit level, ESRAs will be done by the **certificate holder**, in order to identify the lowest risk option and any additional mitigation measures. The certificate holder is also responsible for incorporating ESRA results into operational plans or prescriptions for implementing mitigation measures at a site level.

Undertaking and interpreting ESRAs

- Collaboration is allowed between certificate holders, who have similar forest conditions and pest problems.
- Collaboration is encouraged among research institutes, and other organisations to identify and develop less hazardous alternatives.

CH Requirements

- Perform comparative ESRA according to scale, intensity and risk (SIR) as part of its IPM strategy to identify the lowest risk option for a pest, weed or disease control, the conditions for its use and the generic mitigation and monitoring measures to minimise the risks.
- Consider in their ESRA the minimum list of types of hazard and exposure elements and exposure variables (above). [Annex 2 FSC-POL-30-001 v3-0 En](#)
- Conform with the applicable international and national indicators and thresholds for the use of HHPs.
- Engage with stakeholders in conformance with the requirements in the applicable National Forest Stewardship Standard or Interim National Standard when conducting the ESRA.

Interpreting ESRA findings by CH

Give preference, as a matter of principle, to:

- Non-chemical methods over chemical pesticides.
- Chemical pesticides not listed in the FSC list of HHP over those listed in the FSC list of HHPs.
- FSC restricted HHPs over FSC highly restricted HHPs.

Select the option that demonstrates the least social and environmental damage, more effectiveness and equal or greater social and environmental benefits.

Before applying any chemical pesticide, incorporate the results of their ESRA to site operational plans, to identify site-specific risks and adapt the generic mitigation and monitoring measures previously identified in the IPM ESRA (clause 4:12.2).

Make the ESRA and incorporation to the operational plans available to affected stakeholders upon request.

Consult the online FSC database for information exchange on alternatives and monitoring procedures.

In addition:

- Certificate holders need to have programmes in place, according to SIR, to research, identify and test alternatives to replace FSC highly restricted HHPs and restricted HHPs with less hazardous alternatives. Programmes shall have clear actions, timelines, targets and resources allocated.
- Inform third party processing plants located in the spatial area of the management unit and third party nursery suppliers of the list of FSC prohibited

chemical pesticides, encouraging them to avoid these pesticides in their processes and in the production of seedlings and other materials entering the management unit.

- Request the list of FSC prohibited chemical pesticides used by processing plants and nurseries suppliers described above.

CH Monitoring requirements

Maintain records of chemical pesticide usage, including:

- Trade name
- Active ingredients
- Quality of active ingredient used
- Period of use
- Number and frequency of applications
- Location and area of use
- Reason for use

In repairing damages to environmental values and human health from the use of chemical pesticides the CH shall

Prioritise risk prevention and mitigation over damage repair and compensation.

Repair damages according to their magnitude, in consistency with [Criterion 6.3 of FSC-STD-01-001 FSC Principles and Criteria v5-2](#), regarding environmental damage and Criterion 2.6 regarding occupational injuries.