

## Annex 5: Impact Assessment

The impact of each activity on each receptor was assessed according to magnitude on a scale of -10 to 10, where negative values indicate a negative influence on the receptor, and importance on a scale of 0 to 10, which encompasses the probability of occurrence, frequency of the impact etc. The numbering system is used as a relative measure, where more negative numbers correspond to impacts having a higher negative magnitude. Susceptible receptors and corresponding activity are deduced and addressed if both magnitude and importance are of minor severity.

Further, the Buroz Relevant Integrated Criteria and is used to determine the total importance, I, of the impact for each activity on all receptors and of the project overall.

On the basis of the value of the importance of impact, I, obtained, the severity of the impact of an activity is assessed.

### Impact Significance identified

After the impacts are identified, the matrix of the impacts significance by each phase reveals that the construction and operation Phases are those who have more impacts, but according with the methodology, are moderated impacts. The importance of the impact reveals the relation through the impact is measured qualitatively in function of the grade of incidence or intensity of the alteration produced, and the characterization of the effect with some attributes such as extension, type of effect, persistence, accumulation, etc.

- **Sign:** The sign of effect, and therefore the impact refers to the beneficial character (+) or harmful (-) of the various loads acting on the various factors considered. There is the possibility of including, in some duly justified specific cases and argued, a third character (\*), reflecting effects associated with the activity outside circumstances, so that only through a comprehensive study of all would be possible to know its harmful or beneficial nature.

- **Intensity (IN):** This term refers to the degree of impact of the action on the factor, in the specific field that acts. The rating scale will be between 1 and 12, in which 12 expressed total destruction factor in the area in which the effect occurs, and 1 minimal involvement. Values between those two terms reflect intermediate situations. It should be noted that this assessment is made based on a percentage of the project area (project area and / or their catchment areas, if applicable) being directly affected.

- **Extension (EX):** It refers to the theoretical area of influence of impact in relation to the environment of the activity (area percentage, relative to the environment, in which the effect manifests itself). Area of Direct Influence (AID) is used as a reference for quantification

If the action produces a much localized effect, the impact is considered to have an ad hoc basis (1). If, however, the effect does not allow a precise location within the environment of the activity, taking a widespread influence on the whole, the impact will be Total (8), considering the intermediate situations, by gradation, as partial impact (2) and large (4).

- **Momentum (MO):** The term refers to the manifestation of the impact time between the onset of action (to) and the beginning of the effect (tj) on the factor / environmental aspect considered.

If the Momentum is zero, the impact will be immediate, and if it is less than one, short-term year, assigning a value in both cases (4). If a period of time ranging from 1 to 5 years, medium term (2), and if the effect takes to manifest more than five years, long-term, value assigned (1).

If concur any circumstances that would make the critical moment of impact, one might ascribe a value four units specified above.

- **Persistence (PE):** It refers to the time that would remain the effect from its appearance, and from which the affected factor would return to the pre-action by natural means or by introducing corrective measures initial conditions.

If the duration of the effect takes place for less than a year, we believe that the action produces a fleeting effect, assigning a value (1). If it lasts between 1 and 5 years, temporary (2); and if the effect is longer than 5 years, we consider the effect permanent assigning a value (4).

Persistence is independent of reversibility.

- **Reversibility (RV):** It refers to the possibility to rebuild the affected factor due to the thrust action, ie the possibility of returning to the pre-action initial conditions, by natural means, once that ceases to act on the environment. If short-term, ie less than a year, is assigned a value (1), if the medium term, ie a period ranging from 1 to 5 years (2) and if the effect is irreversible, or hard over 5 years, we assign the value (4). The time intervals comprising these periods, are identical to those assigned in the parameter above.
- **Recoverability (MC):** It refers to the possibility of reconstruction, all or part of the affected factor as a result of activity undertaken, ie the possibilities to return to the pre-action initial conditions, through human intervention (introduction of corrective measures).  
If the effect is fully recoverable, and if so immediately, is assigned a value of 1 or a value of 2, if it is the medium term, if the recovery is partial and the effect is mitigated, it takes a value 4; when the effect is unrecoverable assign the value of 8. In the case of unrecoverable (impossible to repair, both natural action such as human disturbance), but there is the possibility of introducing countervailing measures, the value is 4.
- **Synergy (SI):** This attribute provides the reinforcement of two or more simple effects. The total component of the manifestation of the simple effects caused by actions acting simultaneously is higher than one would expect from the manifestation of effects when the actions that causes act independently and not simultaneously.  
If action acts upon a factor, is not synergistic with other actions that act on the same factor, the attribute takes a value of 1, if you have a moderate synergism, it is set to 2 and if it is highly synergistic should be assigned a value of 4. Where cases of weakness occur, the present assessment of the effect of negative values, ultimately reducing the value of the significance of the impact.
- **Accumulation (Ac):** This attribute gives the idea of the progressive increase of the demonstration effect, when it persists continuously or repeated action that generates it.  
If action does not produce cumulative effects (simple accumulation), the effect is evaluated as (1). If the effect is cumulative value increases. (4)
- **Effect (EF):** This attribute refers to the cause-effect in terms of its directionality, ie the form of manifestation of the effect of a factor as a result of an action. An impact may be direct or indirect at the same time, although various factors, since the scale is exclusive, and not the fact that it can be directly and indirectly is valued, it should be the exclusive rating.  
The effect can be direct or primary, and in this case the impact of the direct result of this action, it is assigned a value of 4. If an indirect or secondary effect is present, that is taking place from a primary, and there is no direct effect associated with the same action, the impact is assigned a value of 1. Its manifestation is a direct result of the action, but occurs from a primary effect, is acting as a share of second order.
- **Frequency (PR):** The periodicity refers to the regularity of manifestation of the effect, either cyclic or recurrent (periodic effect) way, sporadically in time (irregular effect), or constant over time (continuous). Continuous effects are assigned a value of 4, to a value of 2 newspapers, and irregular appearance, which discontinuous a value of 1 to be assessed in terms of probability of occurrence, as well.
- **Impact Significance (I):** It has already been suggested that the significance of the impact, that is, the importance of the effect of an action on a factor / environmental aspect, not to be confused with the importance of the affected environmental factor.

Further, the Buroz Relevant Integrated Criteria and is used to determine the Impact significance(I), of the impact for each activity on all receptors and of the project overall.

On the basis of the value of Impact significance (I), obtained, the severity of the impact of an activity is assessed.

Criteria	Definition	Scoring Scale
Intensity (IN)	Degree of destruction of activity on receptor	1 (lowest)-12 (highest)
Extension (EX)	Theoretical area of influence of the impact	1 (localized) – 8 (widespread)
Momentum (MO)	Period of time for manifestation of the impact	4 (immediate: <1 year) – 2 (medium: 1-5 years)- 1 (long term: > 5 years)
Persistence (PE)	Duration of the effect of the impact	1 (fleeting, < 1 year), 2 (temporary, 1-5 years), 4 (permanent, >5 years)
Reversibility (RV)	Possibility of returning to pre-activity	1 (short term, < 1 year)- 2 (medium term, 1-5

	initial conditions by rebuilding or natural means	years) – 4 ( long term, > 5 years or irreversible)
Recoverability (MC)	Possibility of reconstruction with corrective measures	1 -2 (full and immediate recovery)- 4 (partial recovery and medium term)- 8 (unrecoverable)
Synergy (SI)	Reinforcement ability of manifested effects	1(No synergy of actions on a receptor) -2 (moderate synergism)-4 (high synergy)
Accumulation (Ac)	Progressive increase of the effect	1 (no cumulative effect)-4(cumulative effect)
Effect (EF)	Directionality of impact-the cause (action)-effect (impact)	4 (direct)- 1 (indirect)
Frequency (PR)	Regularity of manifestation of the effect	4 (continuous)– 2 (irregular)-1 (periodic)

$$I = \pm (3IN + 2EX + MO + PE + RV + SI + AC + EF + PR + MC)$$

The impact significance has values between 13 and 300 points. It has intermediate values when any of the following circumstances:

- Total current and minimum condition of the remaining symbols.
- High or very high intensity, high or very high condition of the remaining symbols.
- High intensity, high unrecoverable effect and condition of any of the remaining symbols.
- Medium or low intensity, effect and high unrecoverable condition of at least two of the remaining symbols. Impacts with values lower than 25 are irrelevant or importance is compatible or environmental measures contemplated in the project design.
- Minor have an important impact between 26 and 50. They will be severe when the importance is between 50 and 75 and critical when the value exceeds 76.

This matrix is two-dimensional, where the stages of the project (activities) are assessed in relation to the existing environmental characteristics and conditions that may be affected during the execution of those actions.

Criterion	Definition	Scoring Scale
Intensity (IN)	Degree of destruction of activity on receptor	1 (lowest)-12 (highest)
Extension (EX)	Theoretical area of influence of the impact	1 (localized) – 8 (widespread)
Momentum (MO)	Period of time for manifestation of the impact	4 (immediate: <1 year) – 2 (medium: 1-5 years)- 1 (long term: > 5 years)
Persistence (PE)	Duration of the effect of the impact	1 (fleeting, < 1 year), 2 (temporary, 1-5 years), 4 (permanent, >5 years)
Reversibility (RV)	Possibility of returning to pre-activity initial conditions by rebuilding or natural means	1 (short term, < 1 year)- 2 (medium term, 1-5 years) – 4 ( long term, > 5 years or irreversible)
Recoverability (MC)	Possibility of reconstruction with corrective measures	1 -2 (full and immediate recovery)- 4 (partial recovery and medium term)- 8 (unrecoverable)
Synergy (SI)	Reinforcement ability of manifested effects	1(No synergy of actions on a receptor) -2 (moderate synergism)-4 (high synergy)
Accumulation (Ac)	Progressive increase of the effect	1 (no cumulative effect)-4(cumulative effect)

Effect (EF)	Directionality of impact-the cause (action)-effect (impact)	4 (direct)- 1 (indirect)
Frequency (PR)	Regularity of manifestation of the effect	4 (continuous) – 2 (irregular)-1 (periodic)
Importance of Impact (I)	$I = \pm (3 \times IN + 2 \times EX + MO + PE + RV + SI + AC + EF + PR + MC)$	

The table below is based on the Buroz's Relevant Integrated Criteria



