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**Cres  
Science Bulletin**

**N°2, April 2015**

Improving resilience to climate risks processes:  
theoretical and methodological aspects

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This Bulletin proposes theoretical and methodological indications for the improvement of climate resilience processes. These indications include the impact equation and the resilience operators.

### I. Impact Equation

Let  $S$  be a given system,  $(e)$  a state of this system and  $(r)$  a climate risk.

The impact equation we propose is an equation that characterizes  $S$  states in terms of vulnerability or resilience to  $(r)$ . It is:

$$\hat{R}e = d \quad (1)$$

where  $\hat{R}$  is an operator associated with the risk  $r$  and  $d$  is the set of impacts induced by  $r$ .

If  $d \neq \emptyset$ , then  $S$  is vulnerable to risk  $r$ ; conversely, if  $d = \emptyset$ , then  $S$  is resilient to  $r$ .

### II. Process and operators of resilience

Theoretically, a resilience process implements a resilience  $A_r$  operator, such as:

$$A_r (ev) = er \quad (2)$$

Where  $(ev)$  is a state of vulnerability of the system  $S$  and  $(er)$  is a state of resilience.

In practice, a resilience operator is a resilience project, program or strategy.

### III. Methodological aspects

Climprospect is the proposed methodological framework. It is illustrated schematically in figure (1). It includes several specific units:

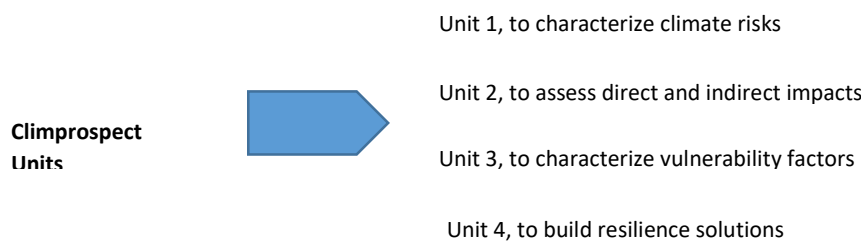


Figure (1): Climprospect Units

#### 1. Vulnerability factors

Vulnerability is the basic information that guides the development of resilience processes to climate risks. In practice, it results from the combination of a series of factors, so-called vulnerability factors. For a risk  $r$ ,  $V_r$  is the set of vulnerability factors. In practice, there are several categories of vulnerability factors as shown in Figure (2). The order 3 unit of Climprospect can be used to establish these different categories for a climatic risk  $r$ .

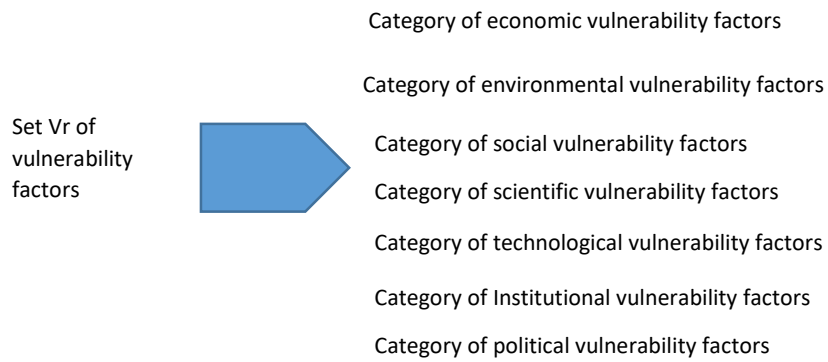


Figure (2): Categories of vulnerability factors

## 2. Resilience solutions

To address the vulnerability, specific resilience solutions are implemented. As shown in Figure (3), there are several categories of resilience solutions. They can be developed by implementing the Climprospect order 4 unit.

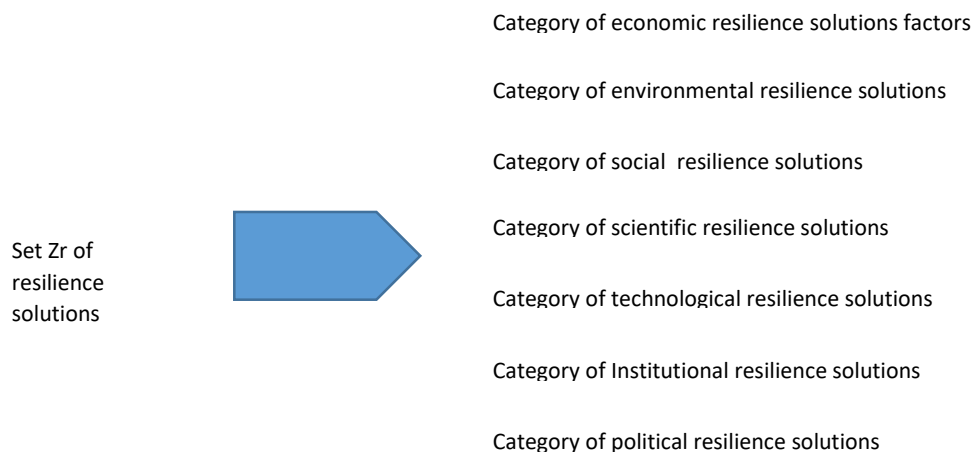


Figure (3): Categories of resilience solutions