

Cres facts Sheets

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**Scientific basis and methodological aspects of
integrating climate change into
sectoral policies**

M. Badolo

cres.courriel@gmail.com

cwww.cres-edu.org



Climate change
and development

Climate change poses threats to human communities and their development:

- ❑ *a loss of development achievements;*
- ❑ *a deterioration of development prospects;*
- ❑ *an increase in the cost of development;*

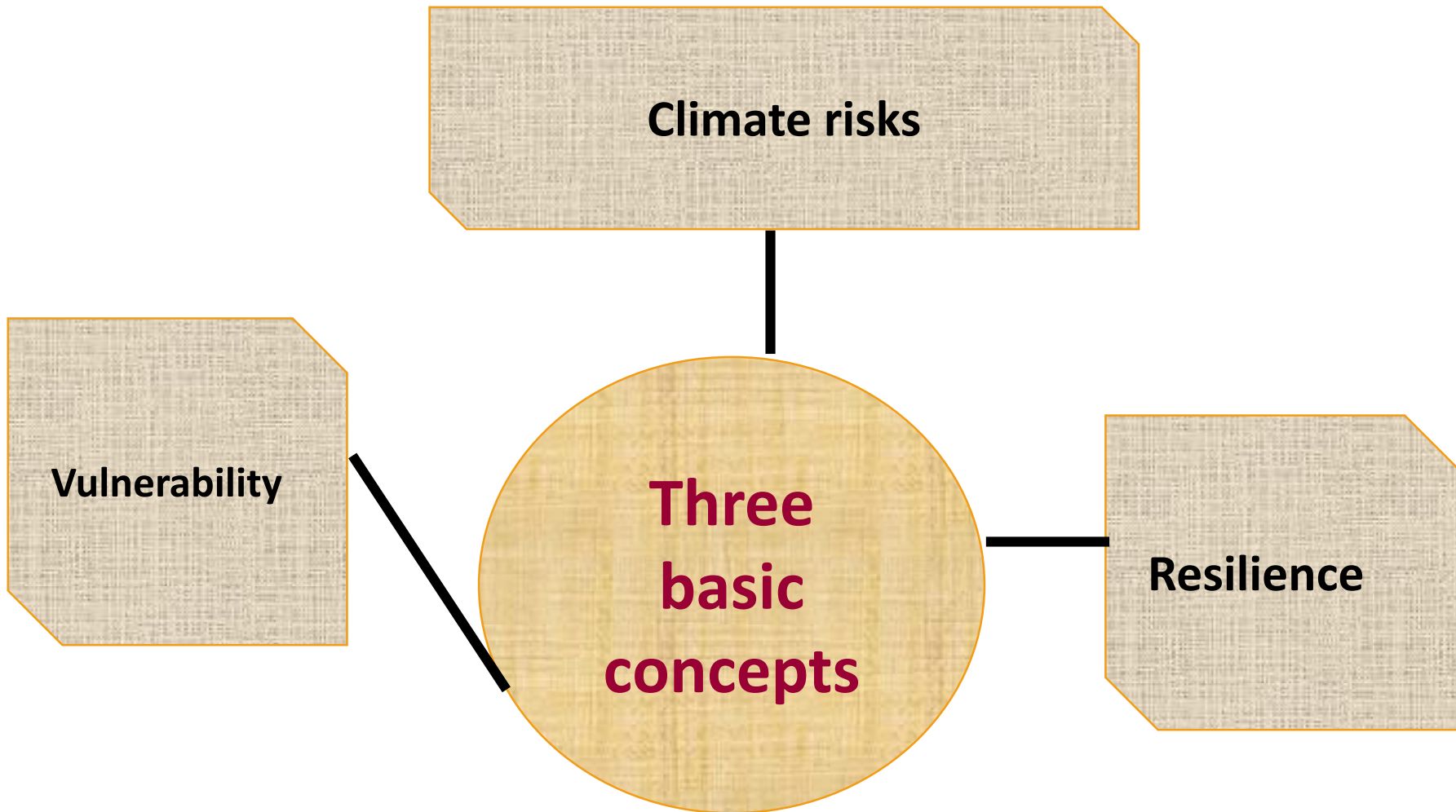
The basic option for securing human communities and their development against climate change threats is to take this threats into account in development policies and programs.


The overall objective of this facts Sheets is to propose an approach, tools and methodologies for integrating climate change into sectoral development policies



**Basic
concepts**

The three basic concepts considered





Scientific basis
of
vulnerability
and
resilience

Usual definition of the vulnerability

Vulnerability refers to the extent to which a given system is susceptible or unable to cope with the adverse effects of a given risk.

Such a definition is not very operational

Theoretical aspects of the vulnerability

Let S be a specific system in a configuration or state (e) and r a given risk.

S is vulnerable to r ,
if (e) verifies the impact equation:

$$r(e) = d \neq \emptyset$$

(d) is a set of impacts or damages induced by
the risk r :

***Where there is vulnerability, there are impacts
or damage, when the risk occurs***

Vulnerability and state change of systems

Let S be a specific system (agriculture, livestock, food security), r a given risk which affects S at a moment t_0 and dt a short time interval

S is vulnerable to risk r if

S is vulnerable to risk r if

$$e(t_0 - dt) \neq e(t_0 + dt)$$

The S system is not in the same state before and after the occurrence of the risk

The change of state of a system seems to be the most appropriate theoretical concept for the study and management of vulnerability.

Theoretical aspects of the resilience

Resilience is the opposite of vulnerability,

Let S be a specific system in a configuration or state (e) and r a given risk.

S is resilient to r ,

if (e) verifies the equation:

$$r(e) \approx \emptyset$$

**In a resilience configuration (e) ,
there are no significant impacts
or damages when the risk occurs**

Change of state and risk resilience

- ❑ S a system (agriculture, livestock, food security)
 - ❑ e is the state of this system
 - ❑ r a risk (flood) that affects S at a moment
 - ❑ dt, a short time interval
- S is resilient to risk r if

$$e(t_0 - dt) \approx e(t_0 + dt)$$

The system is almost in the same state just before the risk and just after the risk

The state (e) of a
system S
determines its
vulnerability or
resilience to a given
risk r

Elements of a resilience process

In the present case :

- S a specific system;
- r a given risk;
- ev a vulnerability configuration of S to r;
- er a desired resilience configuration of S to r;

To establish the S system in the resilience configuration (er) from the vulnerability configuration (ev), we use an operator Ar , which is a resilience operator:

$$Ar (ev) = er$$

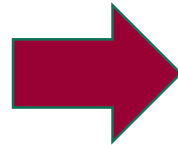
The elements to characterize a resilience process are as follows:

$ev, er, et, Ar,$

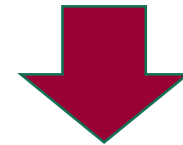
Taking climate change
into account in
development policies
involves integrating
families of resilience
measures into
these policies

Approach for integrating climate change into sectoral development policies

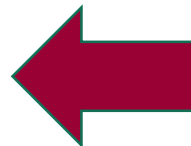
Mapping of climate risks



Matrix of impacts of climate risks



Scheme of integration of climatic risks



Matrix of vulnerability to climate risks



**Scheme of
integration of
climatic risks**

