

*Land-use related choices under the Kyoto Protocol
Graz, 2-4 of May 2005*

Revegetation activities in the Mediterranean areas as influenced by the definition of forest

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Paper outline

A. INTRODUCTION

B. CRITERIA THAT INFLUENCE AREA ELIGIBLE FOR REVEGETATION (RV)
→ SIGNIFICANCE OF RV in the MEDITERRANEAN AREA

C. PRELIMINARY STUDY TO EVALUATE RV SIGNIFICANCE AT THE NATIONAL LEVEL

- Area Change (EU CORINE Land Cover)
 - C -Accumulation Rates (influencing factors)
 - Costs connected to RV election under KP's Art. 3.4
- benefits vs. costs = cost effectiveness of RV election

A. Introduction



Hierarchy among elected activities

'Forest' definition

ART. 3.4

ART. 3.3

CM/GM

RV

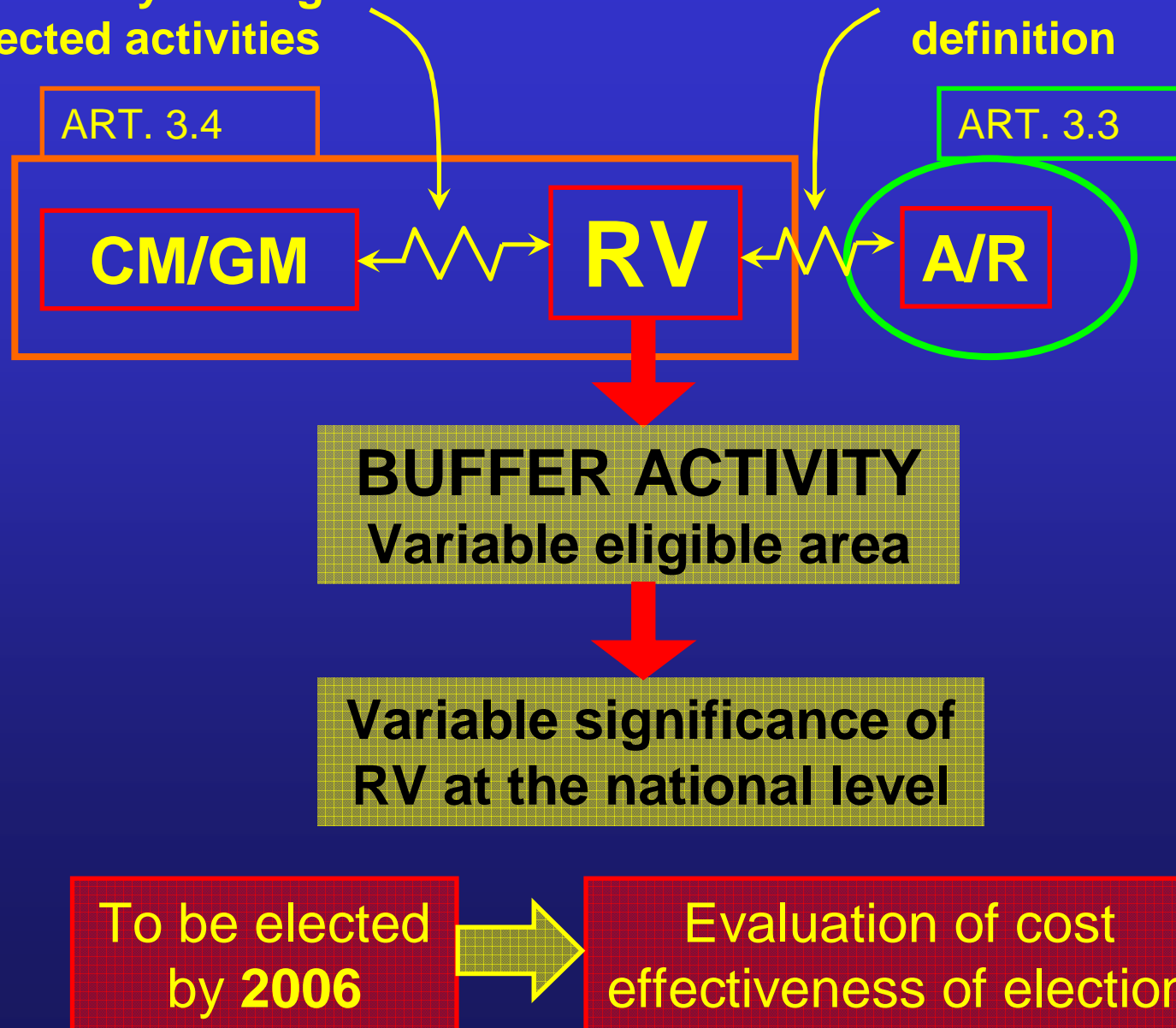
A/R

BUFFER ACTIVITY
Variable eligible area

Variable significance of
RV at the national level

To be elected
by 2006

Evaluation of cost
effectiveness of election



MEDITERRANEAN AREA



**VEGETATION EXPANSION IN
ABANDONED AGRICULTURAL LAND
COULD ASSUME SIGNIFICANCE TO
ACHIVE THE KP COMMITMENTS
(UNDER BROAD ASSUMPTIONS/DEFINITIONS)**

Forest expansion (1965-1994, FAO):

- EU : 10,1 Mha
- Mediterranean area: 7,2 Mha (70%)

**ABANDONMENT of
AGRICULTURAL
AREA**

**FOREST
EXPANSION**

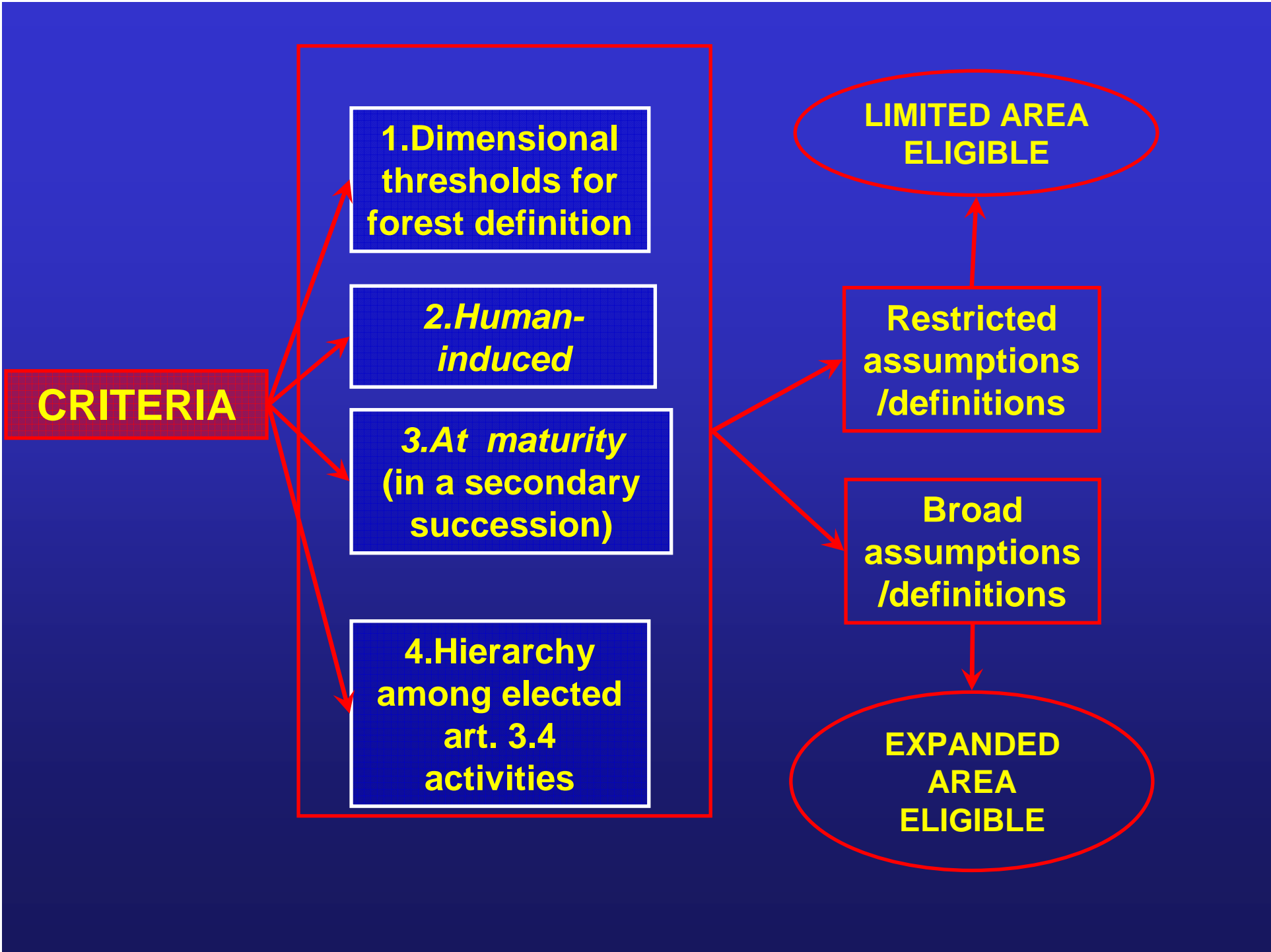
**SHRUBLAND
EXPANSION
(MAQUIS) → RV**

Years	EU (million ha)	EU Mediterranean area (million ha)
1965	103.2	36.5
1970	106.9	39.5
1975	109.6	41.1
1980	110.9	42
1985	111.4	42.3
1990	112.7	43.1
1994	113.3	43.7
2000	113.9	44.3
2005	114.9	44.8
2008	115.2	45
2010	115.4	45.1
2012	115.6	45.3
1965-2012	12.4	8.8
1990-2012	2.9	2.2
2008-2012	0.4	0.3

**Lack of
data**

B. CRITERIA THAT INFLUENCE AREA ELIGIBLE FOR REVEGETATION (RV)





1. ELECTED FOREST DEFINITION

2-5 m height, 10-30% crown cover

Highest thresholds

Most of shrubs and sparse vegetation reported under RV

Lowest thresholds

Limited vegetation types reported under RV

A/R

2. HUMAN-INDUCED

*human-induced
promotion of natural
seed sources*

Broad definition
→ Natural RV eligible
(land-use planning)

Strict definition
→ Natural RV excluded

3. AT MATURITY

Under site
conditions

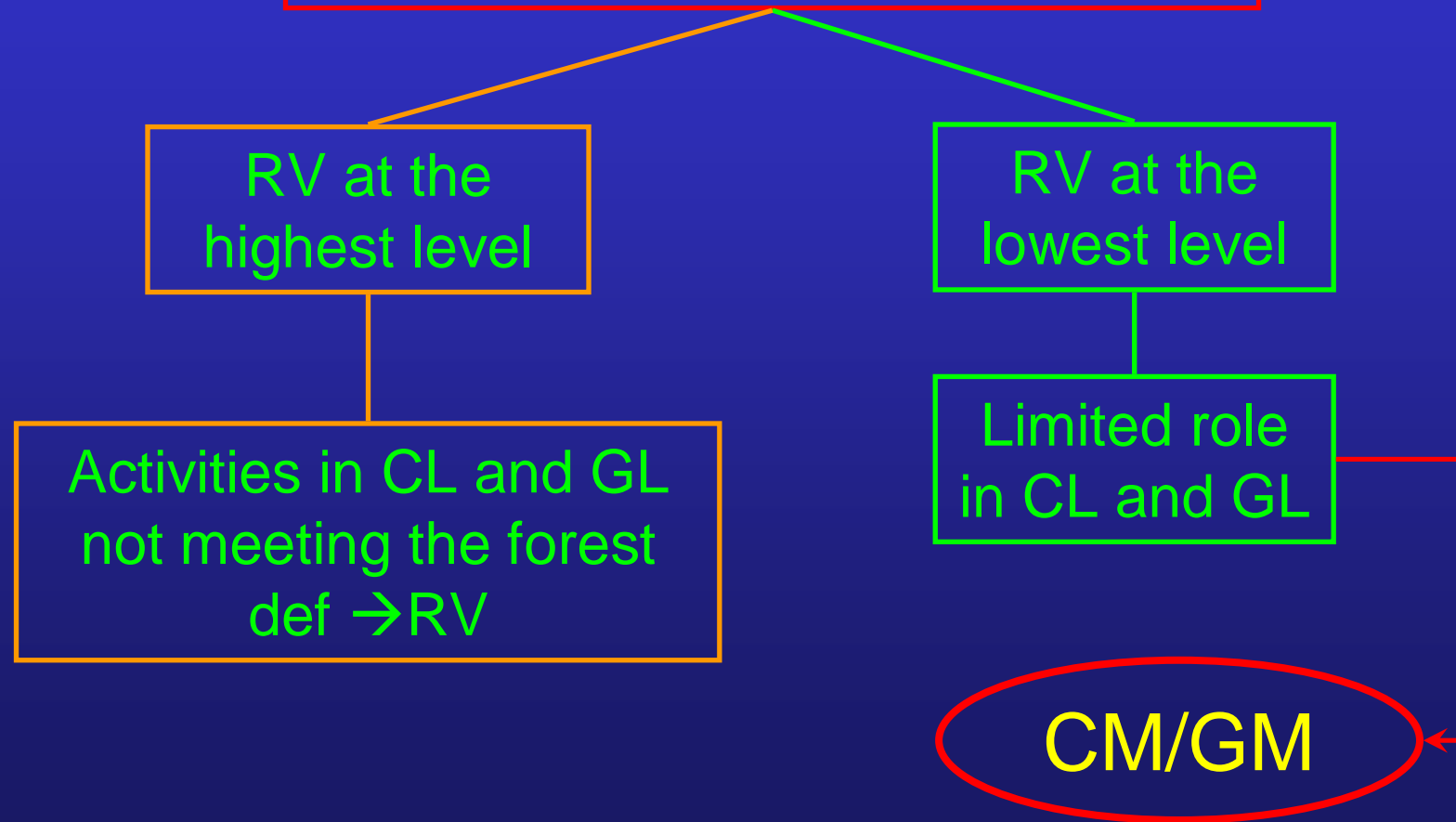
Potential

Vegetation not developing
to forest under site
conditions → RV

Vegetation not developing
to forest under optimum
conditions → RV

A/R

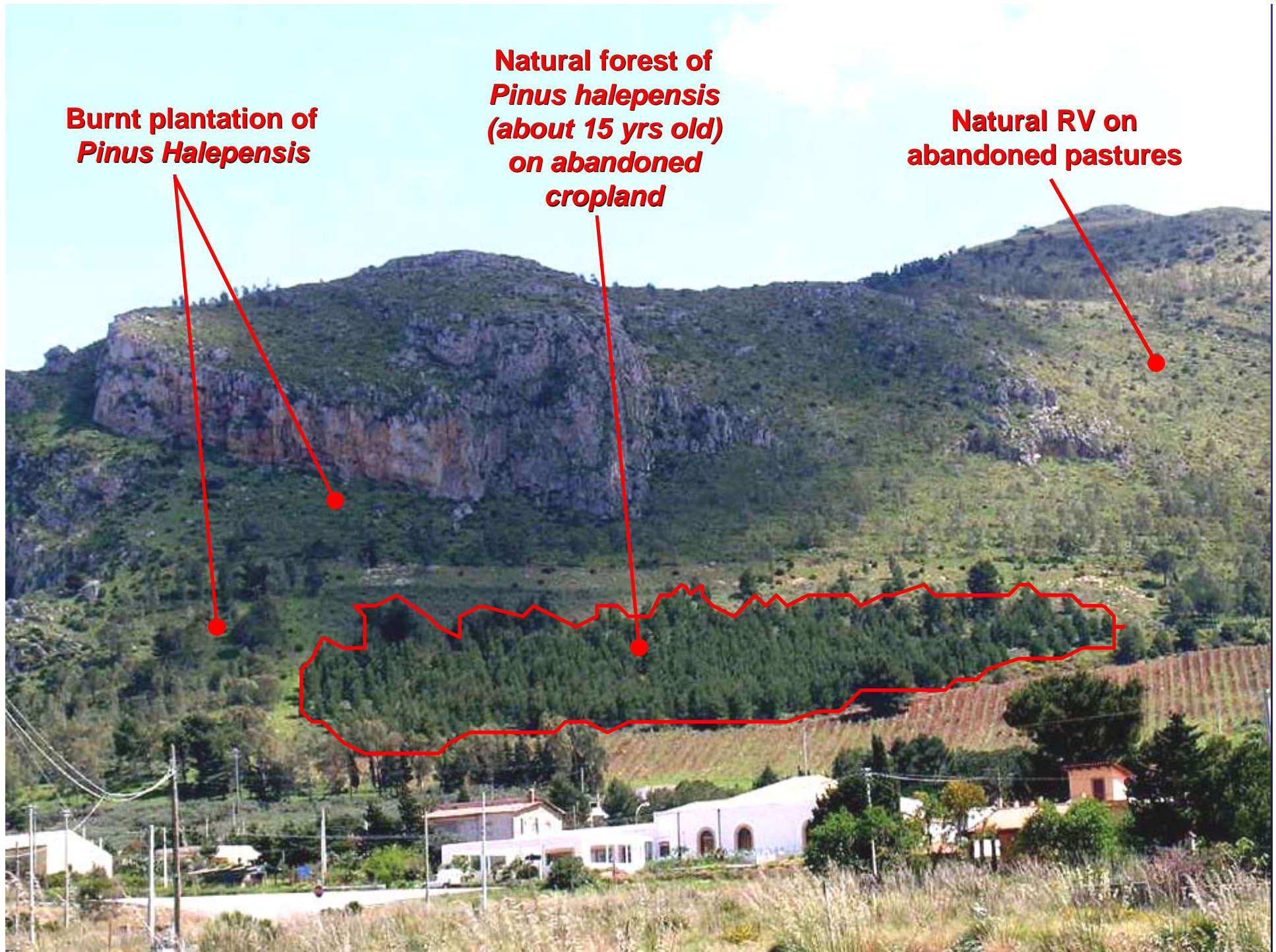
4. HIERARCHY AMONG ELECTED ART. 3.4 ACTIVITIES



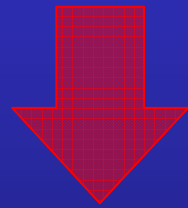
**Burnt plantation of
*Pinus Halepensis***

**Natural forest of
Pinus halepensis
(about 15 yrs old)
on abandoned
cropland**

**Natural RV on
abandoned pastures**



The activities eligible for RV affect types of vegetation that are usually not monitored at the national level (NFIs, large-scale surveys, national statistics, etc.)



PRELIMINARY STUDY on the significance of the activities at the national level should be promoted in order to estimate the **COST EFFECTIVENESS** of the election of RV by a Party

C. PRELIMINARY STUDY TO EVALUATE RV SIGNIFICANCE AT THE NATIONAL LEVEL



- **DEFINE ACITIVITIES ELIGIBLE FOR RV according to NATIONAL DEFINITIONS**
- **EVALUATION of AREA AFFECTED BY RV ACTIVITIES (Corine Land Cover, National Land-Use Maps, National Statistics)**
- **EVALUATION of CARBON SINK (default rates of carbon change)**
- **ERRORS/UNCERTAINTIES EVALUATION**
- **ASSESSMENT OF MONITORING COSTS**
- **COSTS/BENEFITS COMPARISON**

LAND-USE CHANGE

CORINE LAND COVER: 1990 ↔ 2000

(where national databases are not available)

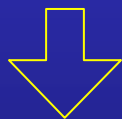
NO LAND COVER CLASS REPRESENTS RV

(Transitional woodland/shrubland = revegetation + degradation)



TRACKING of LAND-USE CHANGES BETWEEN CATEGORIES IS NEEDED

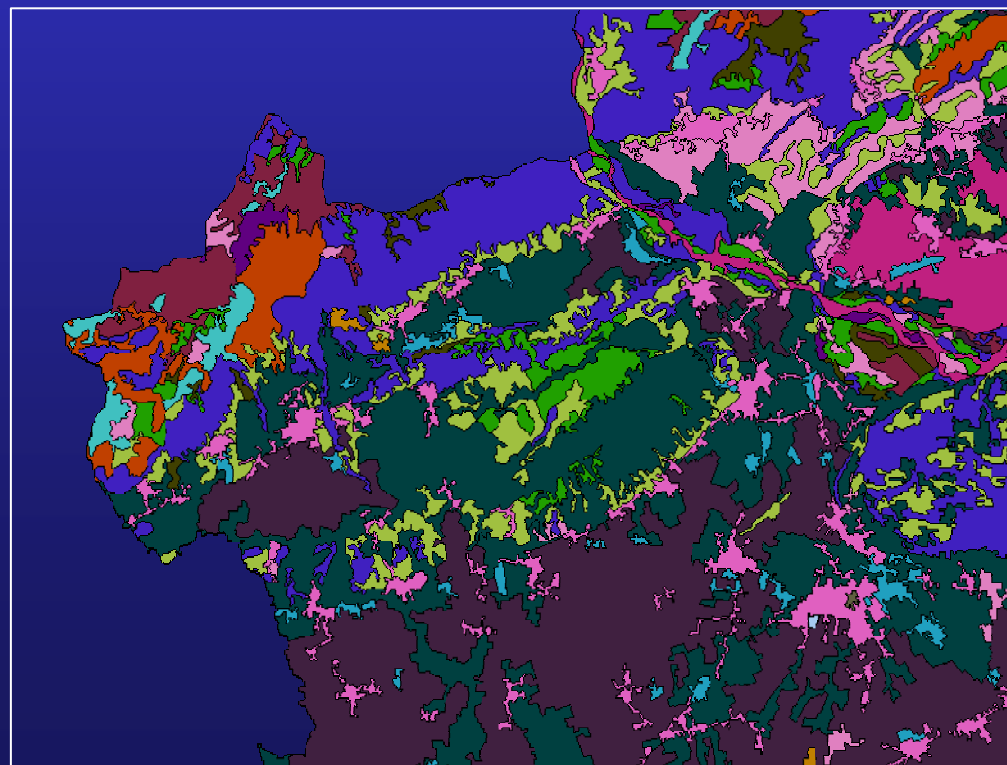
(Approach 2, IPCC GPG)



**DEVEGETATION
PROCESSES MUST BE
TAKEN INTO ACCOUNT**

(adverse land-use
changes)

**TO AVOID
OVERESTIMATES**



Carbon accumulation rates

→ HIGH UNCERTAINTIES

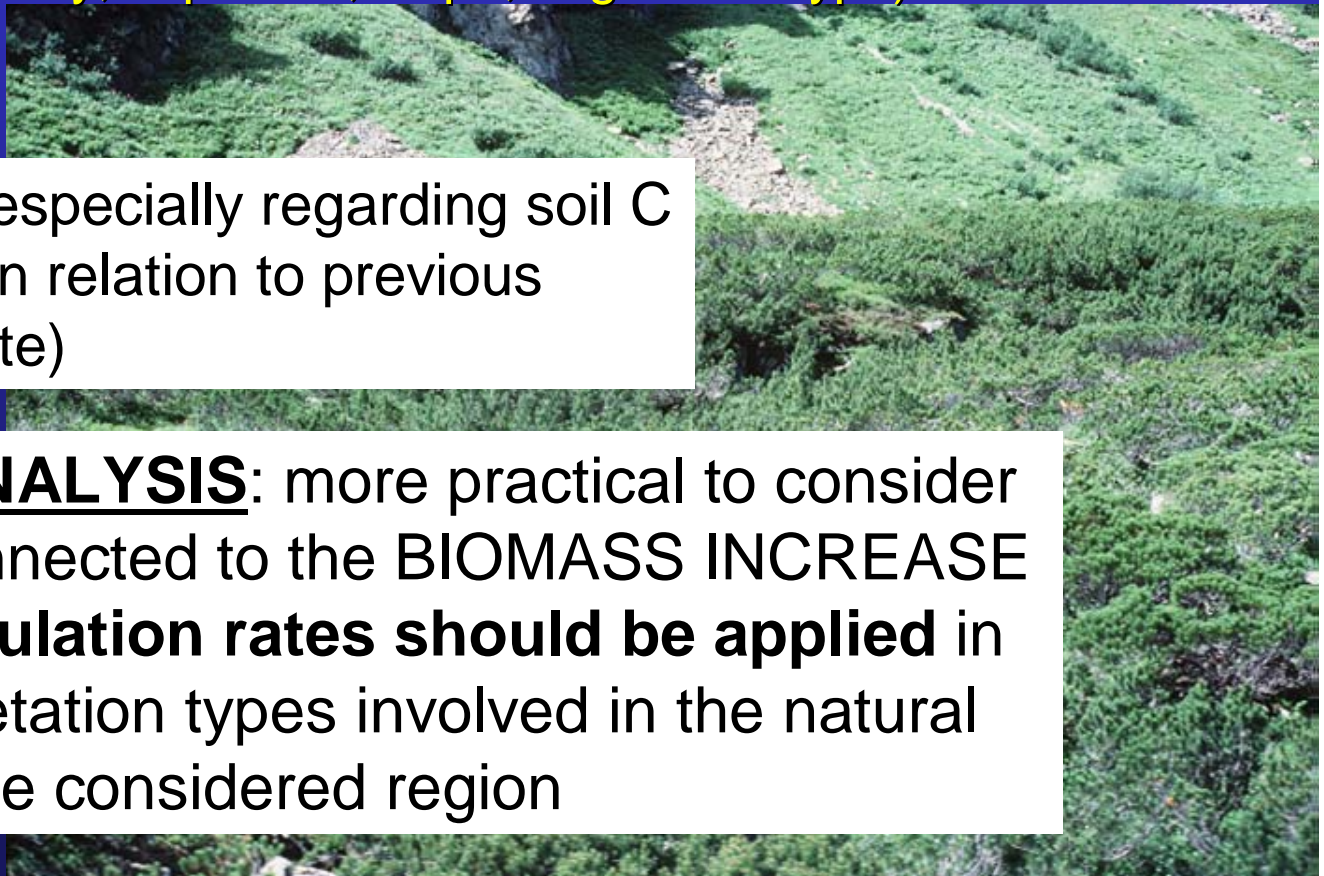
Carbon changes due to natural RV on abandoned agricultural land don't follow a single occurrence.

Several factors drive the carbon dynamics during a secondary succession:

- climate
- physiography (soil quality, exposure, slope, vegetation type)
- the former land-use
- disturbances

→ **variable results** especially regarding soil C changes (variability in relation to previous conditions and climate)

PRELIMINARY ANALYSIS: more practical to consider only the C sink connected to the BIOMASS INCREASE
Specific C accumulation rates should be applied in relation to the vegetation types involved in the natural recolonisation in the considered region



ERRORS / UNCERTAINTIES

AREA EVALUATION (CLC):

- MINIMUM AREA: 25 ha (grid cell size 6.25 ha), 5 ha for land-use change
- FOREST DEFINITION: tree height 5 m, crown cover 30%
- LAND COVER CLASSES (no clear definitions for the identification of land undergoing RV process)
- PROJECTIONS to FIRST COMMITMENT PERIOD (1990-2000 → 1990-1st CM)



Additional information (country-level data) could be needed to correct the RV area

ERRORS / UNCERTAINTIES

C ACCUMULATION RATES:

- VARIABLE BIOMASS INCREASING RATES according to vegetation typology and site conditions
- VARIABLE C ACCUMULATION RATES IN SOILS (possible C depletion → degradation due to land abandonment)

ASSESSMENT of MONITORING COSTS

AREA

NATIONAL INVENTORIES AND DATABASES PROVIDE SCARCE INFORMATION ABOUT LAND-USE CHANGES ELIGIBLE FOR RV
→ evaluation of the available tools and data for the monitoring at national scale should be provided

COSTS CONNECTED TO THE AVAILABLE INFORMATIONS

ITALY:

- First NFI (1985): forest definition → no tree height
- New NFI: forest definition is changed → not comparable

Implementation of the **net-net accounting**

AREA
1990

AREA
2008-2012

New NFI	Costs (€/point)	N. of points
1° stage: Forest/not forest (remote sensing)	0.72 (1point/Km2)	300 000
2° stage: definition of forest category (expeditious field survey)	72 (probably higher: 140)	100 000
3° stage: Biomass measures (field survey)	288	33 000

25-47
€/Km2

ASSESSMENT of MONITORING COSTS


C accumulation rates

Detailed C accumulation rates should be provided for different RV typologies according to:

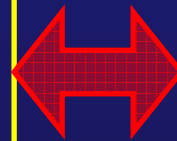
- anthropogenic disturbances
- site quality
- climatic factors



CONCLUSIONS

- RV significance is highly dependent on national definitions
 - RV plays a role in the Mediterranean area under a broad definition:
 - Restricted assumptions → shrubland plantations (not forest)
= very limited area affected
 - Expanded assumptions → natural RV, linear plantation
= significance to be evaluated\
-  • a preliminary study on the RV significance should be developed on the basis of available national databases

BENEFITS
AREA CHANGE ×
C-ACCUMULATION RATES



COSTS
AREA MONITORING
C-ACCUMULATION RATES