



# FOREST RESTORATION MONITORING TOOL

Draft version for field test

## INTRODUCTION

FAO upon recommendation of its members identified the need to initiate a comprehensive analysis, evaluation and documentation of relevant forestation and restoration programmes and projects in drylands, in collaboration with its member countries, local partner organizations and international institutions and organizations.

This endeavour will aim at compiling and evaluating the lessons learnt and developing operational guidelines for the restoration of degraded forests and lands within the difficult environmental and socio-economic framework conditions in arid zones, for the benefits of the local population. The study will focus on Mediterranean type ecosystems (Mediterranean basin, South Africa, SW Australia, Chile and NW America), the Sahel and other dryland countries in Africa, West and Central Asia, Northern China and Latin America.

For this purpose, FAO developed a comprehensive Forest Restoration Monitoring Tool to analyse and evaluate field projects/programs and to help guide project implementers in compiling the lessons learnt, analysing and monitoring the performance and impacts of forest restoration projects and programmes. The applicability of this tool is currently being field-tested prior to large-scale application. If you would like to participate in this field test and you are willing to share your experience and lessons learnt from forestation and forest restoration projects/programs you are involved in, please fill this monitoring tool as far as possible (one for each project or programme) and return the tool to:

[nora.berrahmouni@fao.org](mailto:nora.berrahmouni@fao.org) with copy to [pregatop@gmail.com](mailto:pregatop@gmail.com)

The results of this process will be included in a comprehensive FAO expert report that will be shared with all contributors, and will be used as the basis for the formulation of operational guidelines for forest restoration in drylands. All contributors will be duly acknowledged in this report.

## I. GENERAL INFORMATION

### 1. Project/programme title

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### 2. Location of the restoration site(s)

Country(s)	
Site(s) name	
Specific location (region, province, municipality, etc)	
Size (ha) as of today	

### 3. Executing organizations

Lead organization			
Project partners	Name of organization		Role
Contact person	Name	First name	Last name
	Job title		
	Organization		
	Email		
	Phone		

### 4. Project Implementation Period

Start date	
End date	

### 5. List of relevant documentation, publications and webpages

Title	Author(s)	Date

## II. SITE DESCRIPTION

### 1. Climate

<b>1.1. Rainfall (mm)</b>	
<b>Annual Average</b>	
<b>Duration of dry period(s) in months and occurrence throughout the year</b>	
<b>1.2. Temperature (°C)</b>	
<b>Maximum T in warmest month</b>	
<b>Minimum T in coldest month</b>	
<b>Is there a frost period? If so, please describe</b>	
<b>Are there occasional heat-waves? If so, please describe (i.e. length, intensity of temperatures, occurrence of strong winds, etc)</b>	
<b>1.3. Extreme weather events</b>	
<b>Do extreme weather events occur in the project area/ region (i.e. storms, floodings, etc)? If so, please describe</b>	
<b>1.4. Climate change</b>	
<b>Have you noticed any climate change related impact or event? If so, please describe</b>	
<b>Are you aware of climate change predictions for the project area/region? If so, please describe</b>	

### 2. Topography, soils, vegetation cover

<b>2.1. General topography</b> Please, describe the topography of the landscape where the project site(s) are located (i.e. flat, undulating, hilly or mountainous; presence of outcrops, cliffs, etc)			
<b>2.2. Elevation range (m)</b>			
<b>2.3. Slope (% of the area)</b> Please estimate the percentage of the area that falls into the following types of terrain. Please note that the percentage shares should add up to 100%			
<10%	10-25%	25-50%	>50%

**2.4 Soil class** (according to FAO soil classification. In case you do not have this information, please make a brief description of the soil in terms of: (i) soil depth; (ii) soil texture, such as stony, sandy, clay, loamy; (iii) soil colour; (iv) soil workability; (v) soil fertility, as for instance suitability for agriculture purposes; (vi) any other relevant features, such as salinity, etc)

Type	Depth	% of the area

**2.5 Have you observed wind or water erosion?** If so, please comment below and provide estimation of occurrence.

Type	% of the area

## 2.6 Vegetation cover before the project/programme started

Please describe briefly the natural vegetation in the area where the project/programme site(s) are located, as well as the presence of non-native plants (i.e. exotic trees, shrubs and herbs) and invasiveness character, if known

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## 3. Socio-economic features of the area where the project/programme site(s) are located

### 3.1. Land use

Type	Yes	No	Main products and/ or crops (if any)	% area
<b>Subsistence agriculture</b>	<input type="checkbox"/>	<input type="checkbox"/>		
<b>Intensive agriculture</b>	<input type="checkbox"/>	<input type="checkbox"/>		
<b>Grazing</b>	<input type="checkbox"/>	<input type="checkbox"/>		
<b>Collection of non-wood forest products</b>	<input type="checkbox"/>	<input type="checkbox"/>		
<b>Fuelwood, Timber</b>	<input type="checkbox"/>	<input type="checkbox"/>		
<b>Mining</b>	<input type="checkbox"/>	<input type="checkbox"/>		
<b>Waste disposal</b>	<input type="checkbox"/>	<input type="checkbox"/>		
<b>Settlements, urban areas, infrastructures</b>	<input type="checkbox"/>	<input type="checkbox"/>		
<b>Nature conservation</b>	<input type="checkbox"/>	<input type="checkbox"/>		
<b>Recreation</b>	<input type="checkbox"/>	<input type="checkbox"/>		
<b>Spiritual (i.e. sacred forests)</b>	<input type="checkbox"/>	<input type="checkbox"/>		
<b>Other:</b>	<input type="checkbox"/>	<input type="checkbox"/>		

### 3.2. Land ownership

Type	% of the area
<b>State owned</b>	
<b>Community-owned</b>	
<b>Private corporate ownership</b>	
<b>Private individual ownership</b>	
<b>Other types:</b>	

### 3.3. Land management

Type	Is there a management plan?		Are restoration actions part of management plan implementation?		% of the area under such type of land management
	Yes	No	Yes	No	
Protected area (PA)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
PA buffer zone with soft land uses	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Productive landscape	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Other types:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

### 3.4. How does the local population benefit economically from the project/programme

<b>Please describe income generation from land uses at the project/programme sites before and after the project. If possible, please provide quantitative information on the number of jobs, and/or the average income/ year</b>	
Before the project	
After the project	

### 4. Forest degradation & deforestation

<b>4.1. What were the main drivers of deforestation or forest degradation before the project/programme started? Please estimate the percentage share according to its significance</b>	% Area
<b>Conversion into agriculture</b>	
<b>Urbanization</b>	
<b>Road construction</b>	
<b>Land abandonment (i.e. abandonment of agriculture terraces)</b>	
<b>Unsustainable /illegal logging</b>	
<b>Forest fires</b>	
<b>Over-collection of firewood</b>	
<b>Forest diseases and pests</b>	
<b>Overgrazing by farm animals or wildlife</b>	
<b>Flooding</b>	
<b>Soil Erosion by wind</b>	
<b>Soil erosion by water</b>	
<b>Landslides, mud slides, etc.</b>	
<b>Frequency of invasive species</b>	
<b>Soil degradation</b>	
<b>Air pollution (acid rain)</b>	
<b>Water pollution</b>	
<b>Other (please indicate):</b>	

### III. FORESTATION and RESTORATION

#### 1. Goals

<b>1.1. General project/programme Goal (as formulated in the document)</b>		
<b>1.2. Scope of the project/programme</b>		
Type (Y= yes; N= no)	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<b>Large-scale forestation/forest restoration</b>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<b>Pilot for demonstration</b>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<b>Research</b>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<b>Community development</b>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<b>Other (describe):</b>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

#### 2. Project/programme objectives

##### 2.1. Project/programme logical framework

If possible, please send attached to this file the logical framework of the project/programme

##### 2.2. Which issues does your project/programme intend to address?

<b>A. Environment</b>						
Soil erosion control	<input type="checkbox"/>	Fire risk reduction	<input type="checkbox"/>	Weed/invasive species control	<input type="checkbox"/>	Watershed protection
Flood control	<input type="checkbox"/>	Water infiltration	<input type="checkbox"/>	Air quality improvement	<input type="checkbox"/>	Mining restoration
Sand dune fixation	<input type="checkbox"/>	Protect/restore species diversity and/or endemic/rare species populations			<input type="checkbox"/>	Wildlife Habitat restoration
Build connectivity	<input type="checkbox"/>	Increase landscape diversity	<input type="checkbox"/>	Increase forest surface	<input type="checkbox"/>	Integrate agriculture-forest uses
C sequestration	<input type="checkbox"/>	Increase resilience against climate change	<input type="checkbox"/>	Other:	<input type="checkbox"/>	
<b>B. Socio-Economics</b>						
Local income generation	<input type="checkbox"/>	Support recreational uses	<input type="checkbox"/>	Restore cultural values	<input type="checkbox"/>	Job creation
Timber production	<input type="checkbox"/>	Non-wood forest products production	<input type="checkbox"/>	Firewood production	<input type="checkbox"/>	Grazing
Support to agro-forestry	<input type="checkbox"/>	Convert marginal land into forest	<input type="checkbox"/>	Other:	<input type="checkbox"/>	
<b>Comments:</b>						

#### 3. Is your project/programme contributing to UN conventions?

<b>III.3.1. Convention on Biodiversity Conservation</b>			<input type="checkbox"/>	<input checked="" type="checkbox"/>
<b>Describe contribution</b>				
<b>III.3.2. Convention to Combat Desertification</b>			<input type="checkbox"/>	<input checked="" type="checkbox"/>
<b>Describe contribution</b>				
<b>III.3.3. Convention on Climate Change</b>			<input type="checkbox"/>	<input checked="" type="checkbox"/>
<b>Describe contribution</b>				

## IV. GOVERNANCE FRAMEWORK

### 1. Forest policy and legislation

<b>1.1 Is there a legal and forest policy framework supporting forest restoration/forestation in the country?</b>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>1.2. Does the project/programme include actions to establish/improve a legal framework?</b>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>1.3. Please name the existing laws and forest policies supporting forestation or restoration</b>					

### 2. Participation and capacity development – Who are the stakeholders who participated in the project/programme in terms of planning, implementation, monitoring/control and capacity development?

2.1. Role/Actor	Private company	Public adm.	Aid Agency	Nat. NGO	Int. NGO	Community group
Land owner	<input type="checkbox"/>					
Design & Planning	<input type="checkbox"/>					
Coordination	<input type="checkbox"/>					
Capacity building	<input type="checkbox"/>					
Technical supervision	<input type="checkbox"/>					
Plant production	<input type="checkbox"/>					
Site selection	<input type="checkbox"/>					
Planting	<input type="checkbox"/>					
Plant maintenance	<input type="checkbox"/>					
Site surveillance	<input type="checkbox"/>					
Monitoring of project success	<input type="checkbox"/>					
Communication	<input type="checkbox"/>					

<b>2.2. Did the project/programme implement any awareness raising and capacity development activities?</b>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Describe what was done and by whom</b>		
<b>Indicate gaps if any on capacity development</b>		

### 3. Cost & financing of the project/programme

<b>Total budget (USD)</b>	
<b>Total restoration cost per ha (USD)</b>	
<b>Average costs of plant maintenance (USD/ha/yr)</b>	
<b>Source of project funding</b>	
<b>Source of funding after project/programme ends</b>	

## V. FIELD IMPLEMENTATION

### 1 Which species have you selected for restoration?

List species name (please, also write the Latin name)	Percentage	Type (C= canopy sp; S= shrub sp; H= herbaceous sp)	Why it was selected?
<b>Native species</b>			
NSP1			
NSP2			
NSP3			
NSP4			
NSP5			
<b>Non-native or exotic species</b>			
ESP1			
ESP2			
ESP3			
ESP4			

### 2. Where did the planting material come from?

(Y= yes; N= no; U= unknown)

	Y	N	U
Is the origin of planting material known?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Do you think that the planting material is adequate?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Does the reproduction material come from selected forest stands or tested clones?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Do the seeds or seedlings come from certified source?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Was the plant material stored/treated before planting?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
How did you select the planting material and which problems did you encounter?			
Briefly explain plant material storing/treatment procedures, difficulties encountered and results			

### 3. Plant production in tree nurseries

	Y	N	U
Is the origin of the planting material known?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Is the planting material produced by the project/programme?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Is the planting material purchased from external suppliers in the same region?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Is the planting material purchased from outside the project/programme region?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Indicate for each species the height (cm) and age (months) of seedlings used in planting?			

## 4. Field seeding/planting operations

### 4.1. Site preparation

<b>Was it necessary to remove natural vegetation before planting?</b> (Y= yes; N= no; P= partially; U= unknown)				<input type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> P <input type="checkbox"/> U
<b>What was the method</b> (i.e. burning; hand-made cutting or uprooting; chemical; ploughing) and equipment used?				
<b>What was the area affected?</b> (i.e. all the restoration site(s); clearing in contour lines; punctual clearing)				
<b>Were all plant species from the natural vegetation removed?</b> (i.e. all vegetation cover was removed; selected species or individuals were maintained)				

### 4.2. Transferring plants to the field

<b>What was on average the time period between the arrival of the plants in the field and the proper planting?</b>			
<b>How the planting material was kept in the field from the arrival of plants till the proper planting?</b>			

### 4.3. Plantation work

Material used in plantations	Seeds	Seedlings	Cuttings	Mixed
<b>Area of application (%) of total)</b>				
<b>Planting density</b> (No/ha or Kg/ha for seeds)				
<b>Planting season/time</b>				
<b>Which planting technique was used/applied? Please, describe methodology, equipment used, and difficulties encountered</b>				
<b>Did you use artificial watering system?</b>	<input type="checkbox"/> Yes		<input type="checkbox"/> No	

**4.4. Maintenance operations in plantation sites (Y= yes; N= no; U= unknown)**

Did you apply any maintenance after planting up to year 3?	Type	Y	N	U
Replacing dead seedlings		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Pruning		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Thinning		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Watering		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Fertilizer application		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Plant shelters		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Fencing		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Weed control		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Pest/parasite control		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other:		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**5. Assistance to available natural regeneration**

<b>5.1. What are the management measures used to assist natural regeneration?</b>	
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## VI. MONITORING

**1. Was there any monitoring since the beginning of the project/programme? If so:**

Y	N	U
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Which aspects were taken into account in monitoring?	
At what intervals/periods was the monitoring carried out?	
Briefly describe how the monitoring was carried out	

## VII. RESULTS AND EXIT STRATEGY

**1. Project/programme performance**

Where the objectives of the restoration project/programme achieved?	Yes	No
	<input type="checkbox"/>	<input type="checkbox"/>

## 2 Project/programme impact

### 2.1. Plantation results

<b>How many hectares did you plant or seed?</b>				
<b>How many plants did you plant per ha on average?</b>				
<b>What was the survival rate (%)? Please, provide general information and specific species data if it is relevant</b>				
<b>Was the restoration supported by any natural regeneration?</b>				

### 2.2. What is the environmental impact of the project/programme?

(I= improved; W= worsened; N= no change; U= unknown)	I	W	N	U
<b>Biodiversity</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Forest structure</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Soil surface conditions</b> (i.e. organic horizon development; absence of soil compaction or crusting; etc)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Soil erosion</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Water run-off</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Other:</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Comments</b>				

### 2.3. Long-term sustainability

	Yes	No	Explain
<b>Were the project/programme objectives, outputs and outcomes fully achieved?</b>	<input type="checkbox"/>	<input type="checkbox"/>	
<b>Were the drivers behind degradation/deforestation in the intervention area fully removed?</b>	<input type="checkbox"/>	<input type="checkbox"/>	
<b>Did the project/programme secure resources for its follow-up?</b>	<input type="checkbox"/>	<input type="checkbox"/>	
<b>Are there any incentives available for local communities to continue the planting program in the future?</b>	<input type="checkbox"/>	<input type="checkbox"/>	
<b>Did the project/programme support the establishment of sustainable income-generating activities?</b>	<input type="checkbox"/>	<input type="checkbox"/>	
<b>Can the project be transferred and duplicated elsewhere?</b>	<input type="checkbox"/>	<input type="checkbox"/>	
<b>List the 3 major achievements from this project/programme</b>			
<b>List the best field techniques used</b>			
<b>List major problems you encountered</b>			

## VIII. Value and Feedback

<b>Do you find this tool useful?</b>	
<b>Are the length and the level of detail appropriate?</b>	
<b>Would you suggest any change for improvement?</b>	

**We would appreciate your contact details in case we may have any queries**

<b>Name</b>	First name	Last name
<b>Job Title</b>		
<b>Organization</b>		
<b>Email</b>		
<b>Phone</b>		
<b>Relationship with the Project/programme</b>		

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