



# **SRI LANKA**

## **Post-Tsunami Environmental Assessment**

**United Nations Environment Programme  
and  
Ministry of Environment & Natural Resources of Sri Lanka**

Published in October 2005  
© 2005 United Nations Environment Programme  
ISBN: 92-807-2653-6  
Job No. DEP/0758/GE

Text by: Julian Caldecott and W.R.M.S. Wickremasinghe  
Graphics by: Global Resource Information Database (GRID) Arendal/Viktor Novikov and Central Environmental Authority (CEA)  
Design by: Nikki Meith  
Printer: SADAG France

This publication may be reproduced in whole or in part and in any form for educational or non-profit purposes without special permission from the copyright holder provided acknowledgment of the source is made. UNEP would appreciate receiving a copy of any publication that uses this publication as a source. No use of this publication may be made for resale or for any other commercial purpose whatsoever without prior permission in writing from UNEP. The designation of geographical entities in this report, and the presentation of the material herein, do not imply the expression of any opinion whatsoever on the part of the publisher or the participating organisations concerning the legal status of any country, territory or area, or of its authorities, or concerning the delimitation of its frontiers or boundaries.

United Nations Environment Programme  
Asian Tsunami Disaster Task Force  
11-13, Chemin des Anémones  
CH-1219 Châtelaine, Geneva  
Tel. : +41 (0)22 917 8615  
Fax: +41 (0)22 917 8988  
<http://www.unep.org/tsunami/>

Ministry of Environment and Natural Resources  
'Sampathpaya'  
No. 82, Rajamalwatte Road  
Battaramulla, Sri Lanka  
Tel. : +94112863652  
Fax : +94112863652  
<http://www.menr.lk/>

*Cover: Parts of Sri Lanka's coast were protected from the tsunami by high, vegetated sand dunes. In some of these places, however, the dunes were broken by river outlets, which allowed the waves to enter the interior. This aerial photograph of the coast of Yala National Park shows both of these effects. Observations like these help to make clear how the coast might be strengthened against future environmental shocks and hazards. [Picture courtesy of The Nature Conservancy.]*

# **Sri Lanka**

## **Post-Tsunami**

### **Environmental Assessment**

**United Nations Environment Programme and  
Ministry of Environment & Natural Resources  
of Sri Lanka**



# CONTENTS

Message from the Minister of Environment and Natural Resources, Government of Sri Lanka .....	4
Foreword by the Executive Director of UNEP .....	6
Executive Summary .....	8
Introduction .....	10
The 'Resplendent Land' .....	12
The time of the great waves .....	14
The environmental assessment .....	18
The tsunami and its effects .....	24
Patterns of wave behaviour .....	26
Coral reefs and sea grass beds .....	26
Mangroves and other coastal forests .....	34
Lagoons, estuaries and wetlands .....	36
Beaches, sand spits and dunes .....	37
Coastal Protected Areas and Special Area Management sites .....	41
Human settlements .....	41
Environmental contamination .....	48
Debris and waste disposal .....	48
Indirect impacts of relief and reconstruction efforts .....	52
Economic and livelihood concerns .....	59
Key issues identified by the assessments .....	63
Recommended actions .....	64
Introduction .....	66
Urgent interventions in particular sectors .....	66
Urgent interventions at specific sites .....	68
Urgent strategic interventions .....	68
Concluding overview .....	74
Bibliography .....	76
<b>ANNEXES</b>	
1 Acknowledgements .....	79
2 Indicative Plan of Action .....	80
3 Acronyms and abbreviations .....	83



## BOXES

1	The multi-donor needs assessment of January 2005 .....	23
2	Awareness and Preparedness for Emergencies at Local Level (APELL) .....	46
3	The World Conference on Disaster Reduction (WCDR) .....	47
4	The Cairo Principles for post-tsunami rehabilitation and reconstruction .....	67

## FIGURES

1	Decision points and end points in managing tsunami wastes .....	53
---	---	----

## TABLES

1	Landward tsunami penetration in Trincomalee and Ampara districts .....	28
2	Impact of 1998 bleaching event on live coral cover in Sri Lankan reefs.....	31
3	The 2004 (pre-tsunami) condition of Sri Lankan coral reefs .....	31
4	The 2004 (pre-tsunami) status of marine protected areas in Sri Lanka .....	31
5	Summary of tsunami impacts on coral reef and fish communities .....	32
6	Tsunami impacts on coral reefs off the eastern coast of Sri Lanka .....	33
7	Tsunami impacts on lagoons and estuaries .....	38
8	Tsunami impacts on beaches .....	39
9	Tsunami impacts on sand spits .....	40
10	Tsunami impacts on sand dunes.....	40
11	Protected Areas in coastal districts affected by the tsunami .....	42
12	Tsunami impacts on Special Area Management sites .....	44
13	Sites for disposal of debris and solid waste .....	54
14	List of temporary dumping sites for solid wastes in Trincomalee District .....	55
15	Guidelines on debris and waste processing .....	56
16	Sectors requiring urgent intervention .....	69
17	Sites requiring urgent intervention .....	70
18	Proposed UNEP activities in support of the Environmental Recovery Programme in Sri Lanka.....	75

# MESSAGE

by A. H. M. Fowzie, MP  
Minister of Environment and Natural Resources  
Government of Sri Lanka



The Tsunami disaster of the 26th December 2004 was the worst natural calamity to have befallen Sri Lanka since historical times. It caused the loss of tens of thousands of lives, property and livelihood damage costing many millions of rupees as well as severe damage to the natural and built environment in most of the country's coastal zone. The extent of the environmental damage was immediately visible throughout the affected areas. In order to evaluate its long-term impacts, as well as to learn important lessons, and to plan and prepare for the future, it was decided to undertake a systematic assessment of the environmental damage caused by this catastrophe using universally acceptable procedures. Apart from the actual direct environmental damage observed, it also became clear that urgent action needed to be taken to integrate environmental considerations in the national recovery

and reconstruction process, to avoid further environmental deterioration and meet the already well-established pressures on natural resources.

Having recognized the nature and magnitude of the problem, the Ministry of Environment and Natural Resources sought the assistance of the United Nations Environment Programme to undertake a comprehensive assessment and to develop and implement a programme of work for environmental remediation. This assessment was done in close cooperation with all relevant national and local agencies and institutions and primarily, by Sri Lankan scientists, from our Universities and other technical institutions under the guidance and supervision of the Ministry. This report is a synthesis of their findings. The outstanding quality of the assessment is a testament to the in-country technical capacity of Sri Lanka. This assessment has not only generated valuable findings and proposals for remedial actions, but it has also contributed to further development of capacity among Sri Lankan institutions and professionals.

I would therefore like to record our sincere gratitude to all those who have contributed to this national exercise and to UNEP for its financial and technical support. I believe that we can see this disaster, if we wish to, not as a meaningless tragedy, but rather as an opportunity to encourage and enable us to achieve our sustainable development goals while ensuring environmental sustainability for current and future generations of Sri Lankans. Perhaps by this means we can manage to find something good in what was otherwise so terrible an event.

A handwritten signature in black ink, appearing to read 'M. Jayasinghe', is written over two parallel diagonal lines that serve as a signature line.

# FOREWORD

by Klaus Töpfer  
United Nations Under-Secretary General  
Executive Director of the United Nations Environment Programme



The unprecedented scale of the tsunami disaster in December 2004 left us all speechless. This was the first natural calamity of such a size to affect densely-populated areas in modern times. Inspired by the tireless efforts of the affected countries, and by an extraordinary outpouring of international support and solidarity, the UN and other international organizations rose to meet tremendous levels of humanitarian need.

As the relief operation evolved, it became clear that key natural life-support systems had been badly damaged – some by the tsunami itself and others beforehand, undermining livelihoods and increasing vulnerability to environmental shocks. These needed to be rehabilitated, but the scale of the task

预览已结束，完整报告链接和二维码如下：

[https://www.yunbaogao.cn/report/index/report?reportId=5\\_11267](https://www.yunbaogao.cn/report/index/report?reportId=5_11267)

