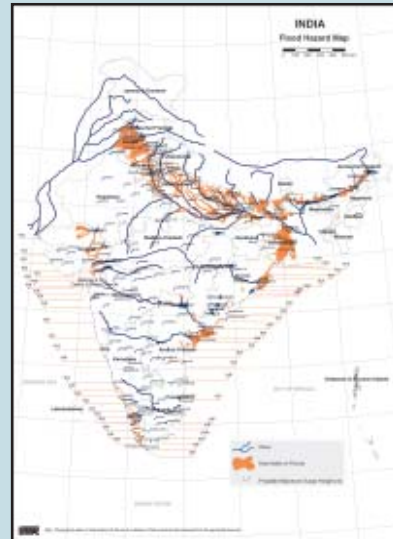




Guidelines

Improving Flood Resistance of Housing

2010



bmtpc

Building Materials & Technology Promotion Council
Ministry of Housing & Urban Poverty Alleviation
Government of India, New Delhi

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FOREWORD

Ever since the Kosi floods of 2008 inflicted damages and loss of lives in a colossal way, BMTPC thought of publishing the guidelines on improving flood resistance of housing which not only dwells upon the planning aspects of houses in flood prone areas but also on construction technologies to be adopted to make them safe in the event of inundation. I am happy to bring out the first ever comprehensive guidelines on flood resistance for the people of India who do not have any access to design, technologies and other paraphernalia. The guidelines are written in simple and easy to understand language and can easily be implemented at field. The publication is the updated version of BMTPC's earlier version of the guidelines which was drafted by Padamshree Prof. Anand S. Arya with the approval of expert group.

It is to be stressed here that India is a country where we have many natural hazards such as earthquakes, cyclones, floods, tsunamis etc. and it is high time that we build in safety culture in our construction practices. Also, there is need of greater outreach and advocacy amongst the masses regarding long lasting disastrous impact of these hazards.

I hope the information given in the guidelines would serve as a useful repository for all stakeholder involved in planning and rehabilitation of flood affected areas.

I place on record my deep and humble appreciation for Dr. Arya, Professor Emeritus, IIT, Roorkee who painstakingly prepared these guidelines.

10th Day of May 2010

Dr. Shailesh Kr. Agrawal
Executive Director, BMTPC

PREFACE

Flood damage to housing, infrastructure, and agriculture has been occurring in India since long times and the problem attracted great attention since independence. However, the causes and nature of damage to *housing* was not studied systematically, nor methods regarding flood safety of housing given due attention.

After the severe floods in Punjab, Haryana and Delhi in 1995, the opportunity of first hand study of building performance during these floods was utilized by commissioning a study by Building Materials and Technology Promotion Council. TARU for Development were assigned the task, who submitted their report titled "Flood Damage Assessment for the North-West Indian Flood of September, 1995" to BMTPC in March 1996. Using the observations, damage assessment and suggestions contained in the report, a preliminary set of guidelines were drafted by Dr. A.S. Arya and Shri S.K. Chaudhuri.

Since then floods have been occurring almost every year in Brahmaputra & Barak valleys in Assam, the northern river plains in Bihar and Eastern river plains in Uttar Pradesh in which lakhs of poor man's huts and homes have been destroyed. The worst floods were caused in five districts of Bihar in 2008 due to the bursting of embankment of River Kosi and diversion of the river flow into an old abandoned course. The safety of the flood impacted population will need reconstruction of houses which should not only be safe against flood damage to foundations *due to scouring and settlement*, and the walls of mud or bamboo, but will also be able to withstand the severe damage under future earthquakes.

These guidelines not only provide design and construction details of small houses but also include recommendations for specifying appropriate clauses in the Building Bylaws. The design of a simple, economical and safe house for construction in flood-cum-earthquake prone areas is presented with sufficient details for easy adoption by governments, NGOs and people themselves.

10th Day of May 2010

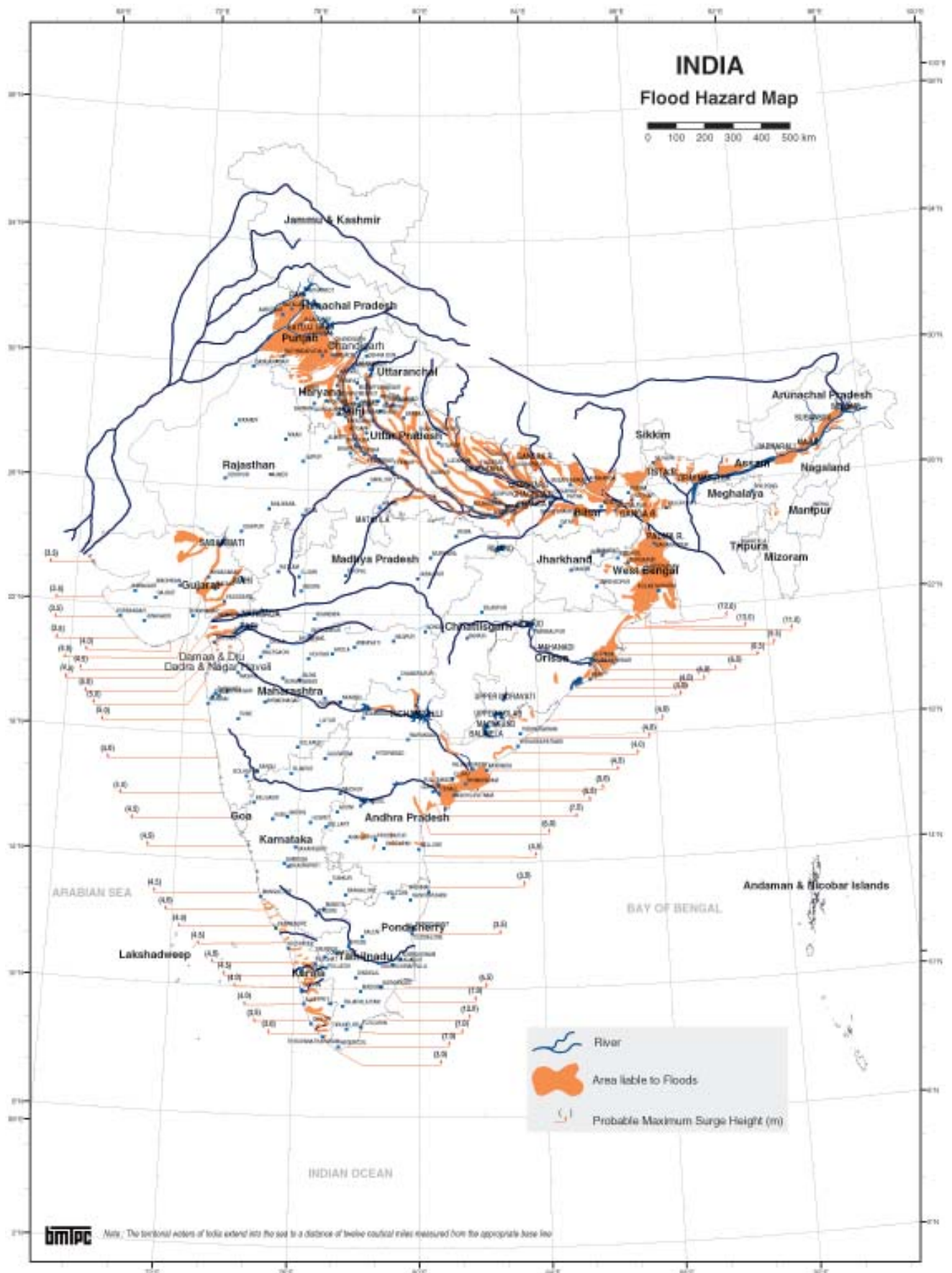
Dr. Anand S. Arya
Professor Emeritus, IIT Roorkee

CONTENTS

1.	THE PROBLEM OF FLOODS IN INDIA	1
2.	SCOPE OF THE GUIDELINES	3
3.	CAUSES OF FLOODS	3
4.	FLOOD MITIGATION MEASURES	4
5.	FLOOD ZONING	5
6.	RAIN ZONING	5
7.	FLOOD INTENSITY	7
8.	ELEMENTS AT RISK OF FLOOD DAMAGE	7
9.	MECHANISM OF DAMAGE TO BUILDINGS	8
10.	CATEGORIES OF DAMAGE TO HOUSING	10
11.	PROTECTION FROM RAIN DAMAGE	10
12.	GENERAL PROTECTION OF HABITAT/BUILDINGS FROM FLOOD DAMAGE	12
13.	SPECIFIC PROTECTION OF HOUSES AGAINST INUNDATION EFFECTS	12
14.	SPECIFIC PROTECTION OF HOUSES AGAINST FLOWING WATER	13
15.	RECOMMENDATION FOR CONSTRUCTION OF FLOOD RESISTANT HOUSES	13
16.	PROTECTION OF EXISTING HOUSES FROM RAIN DAMAGE	15
17.	PROTECTION OF EXISTING HOUSING FROM INUNDATION DAMAGE	15
18.	PROTECTION OF EXISTING HOUSES FROM FLOOD FLOW DAMAGE	15
19.	PREPARATION OF WATER PROOF MUD AND APPLICATION	16
20.	REFERENCES	16

ANNEXURE

1.	Flood prone Areas in States and Districts where more than 10 percent area is flood prone	17
2.	Model Design Detailing for Construction of One Room Mass Housing in Flood Affected Areas of Bihar	19



BMTPC : Vulnerability Atlas of India – 2nd Edition (2006); Peer Group, MoH&UPA; Map is based on digitised data of SOI, GOI; Flood Atlas, Task Force Report, C.W.C., GOI.

Fig. 1: Flood Hazard Map of India