

## Standard operating procedure for carrying out flood protection works

### The roles and responsibilities of specific agencies that have to follow for carrying out the flood management works:

Sl.No	Activities	Description	Responsible Agency(ies)	TaT (Days)	Remarks
1	Budget securing	The agency should process, obtain and plan budgeting for implementing the Flood related works.	Dzongkhag/Thromde		Budget for particular works should be earmarked.
2	Initial site identification	The concerned agency should identify critical sites with flooding risk and propose for technical support by using standard format.	Dzongkhag/Thromde		Use ANNEX I form.
3	Forwarding the request for technical support in flood works.	The concerned Organization/Institutions should request the DES, MoWHS for technical support related to flood assessment studies and management works.	Dzongkhag/Thromde/ Institution/NGO		Standard format should be attached
4	Preparation to visit the site	Desk study for specific area (past flooding events, meteorological and hydrological assessment).	FEMD	10 working days	After receipt of the request letter
5	Joint site investigation	Joint site visits, field survey and field assessment will be carried out.	Dzongkhag/Thromde and FEMD	Duration will depend upon the site conditions	During the site visit, the logistics should be arranged by concerned Agency.
6	Decision on the type of measures required	Whether to propose for long term or short-term measure	FEMD/DES	5 working days	The decision will be made by FEMD
7	Response to the Agency	Reporting back to the Agency about the findings of the site visits.	FEMD	5 working days	After joining office from the site visits and field assessment.
<b>A</b>		<b>Short-term measure</b>			
i	Design of the measures	Design, Drawing and Estimation of the measure.	FEMD	21 working days	After submitting the findings by FEMD, concerned agency should request for the design of the proposed structures
ii	Technical sanction of the design	Forward the complete set of design documents to the concerned agency.	FEMD	3 working days	
<b>B</b>		<b>Long term measure for prioritized areas</b>			
i	Field assessment	Detailed field assessment using assessment forms.	FEMD	15 working days	Depands on size of project area
ii	Cross section Survey	Carry out detail field survey of the proposed area for long term measures.	FEMD	21 working days	Depands on size of project area
iii	Hydrological assessment	Hydrological assessment and analysis (Statistical /modeling) using compiled data.	FEMD	60 working days	Minimum man days
iv	Modelling	Hydrodynamic modeling by using flood modeling software (Arc-GIS, HEC-RAS etc.)	FEMD	45 working days	Minimum man days
v	Analysis of results and scenario	Propose appropriate structural measures based on model results.	FEMD	5 working days	Minimum man days
vi	Flood Management Plan	Draft the sustainable flood management plan accordingly to the outcomes of the detailed study.	FEMD	60 working days	Minimum man days
vii	Drawing and Estimation	Drawing of the flood protection structures and prepare estimates (BoQ) and technical specifications as per the design.	FEMD	30 working days	Minimum man days
viii	Set of complete technical documents	Forward the complete set of flood management plan and design structure documents to the concerned agency.	FEMD	5 working days	
ix	Monitoring	To make site visits for monitoring of the works in order to ensure quality and compliance of design.	FEMD		As and when required
8	Obtain public and environmental clearances	The concerned agency should process and obtain public and environmental clearances.	Dzongkhag/Thromde		
9	Procurement of works	The tendering, evaluation and awarding of work should be carried out	Dzongkhag/Thromde		Specifications and designs should be included properly.
10	Implementation and site supervision	Implementation of flood management structures should be carried out as per design and specifications.	Dzongkhag/Thromde		Inform FEMD in case of any design/site related issues.
11	Monitoring and work progress	FEMD shall carry out monitoring of the work if deemed necessary or upon request from the concerned Agency.	Dzongkhag/Thromde		However, if the budget is with FEMD, the division will plan stage wise monitoring programme
12	Sharing of flood related informations/documents	Any organization in need of flood related documents (flood hazard maps, flood risk maps and flood assessment reports etc) should request in writing to the DES.	Dzongkhag/Thromde/ Institution/NGO		The written request should be made to the Director,DES

