

# Planning of Flood Protection Works

By

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Destructive floods, both large and small have been taking a heavy toll of life and property in Pakistan. The catastrophic flood events in the recent past and consequent heavy losses to the national economy have triggered action to deal with flood problems on a comprehensive basis rather than to continue with the traditional crisis provoked approach. Whereas, complete prevention of floods is almost a physical impossibility, flood protection to the extent technically and economically feasible, is a socio-economic necessity. With proper planning, means can be devised out, not only to reduce flood losses but also to conserve the surplus flood waters for augmenting water availability for productive uses and to promote welfare for the community.

Pakistan is traversed by the mighty Indus, its four eastern rivers of Jhelum, Chenab, Ravi and Sutlaj and also a large number of big and small tributaries including the hill torrents. A major portion of the catchment of the main rivers lies in the high mountains where due to steep grades, heavy and sudden run-off is generated by melting of snow and the rainfall. These high flows inundate a large area in the plains because of flat topography. The numerous hill torrents bordering the plains also bring flashy floods which too contribute towards the creation of flood situation enroute. The problem is diversified in nature and vary from area to area depending upon the physical, hydrological and socio-economic conditions. The more severe flood problem is however encountered during the monsoon season from July to September.

The flood protection bunds have been generally constructed either to protect headworks and other irrigation structures or to safeguard certain towns and cities. There are about 3300 miles of bunds in Pakistan which have been developed in a period extending over a century in face of exigencies of the situation from time to time. The construction had been done mostly by manual labour and not resorting to any compaction as is being practised in the modern times. The old bunds are therefore comparatively much weaker in strength in relation to the recent construction done with the machinery.

The super floods of the year 1973 caused large scale devastation and for quite a while the normal life in the country remained paralysed. The rail-road traffic in the flood stricken area was disrupted and the canal water supply to a large area remained cut off for a considerable length of time. In view of the catastrophic situation, the Federal Government decided that the provinces should create Flood Cells in their jurisdictions to formulate and implement the Flood Control Plans with a view to minimise recurrence of such damages in future. In the pursuance of this decision, the preparation of Flood Plan was taken up in the provinces and certain works had also been strengthened. While provision of the remedial measures was still underway, the floods of the year 1976 (which too were of unprecedented nature) clearly demonstrated existence of major deficiencies in the system and high-lighted the need to tackle the problem on a national level.

In view of the repeated large scale damage, the Government of Pakistan constituted in the year 1977, a Federal Flood Commission at Islamabad to take cognizance of the overall aspect of the floods and to suggest protective measures in the light of latest concepts of water management. The functions assigned to the Commission included:—

- (i) Preparation of a long term flood protection plan for the country.
- (ii) Recommendations regarding regulation of reservoirs for flood control.
- (iii) Measures for improvement of flood fore-casting and flood warning system.
- (iv) Preparation of research programme for flood control and protection.
- (v) Standardization of designs and specifications for flood control works.

The Commission appointed M/s NESPAK as consultants to develop the National Flood Protection Plan by delineating the objectives as under:—

- a) reduce flood losses and sufferings due to floods in an economically sound manner such that the benefits of flood damage abatement measures, as far as possible, exceed their costs;
- b) give priority for flood protection to areas of greatest economic flood damage hazard and/or greatest potential for human suffering, as far as possible;
- c) provide as far as possible, adequate protection from flood damage to developed area lying outside active flood plain of rivers, in particular to protect cities, irrigation works, communications and other vital in-frastructural installations;
- d) make maximum use of existing flood control/protection facilities by improvement, where necessary to bring them to the level of functional capability and reliability to conform to adopted standards;
- e) obtain maximum flood control utilization of multipurposes facilities without adversely affect other functions or compromising the facility;
- f) promote appropriate land use by avoiding the growth of flood vulnerable development in flood hazards areas and adjusting land use, where possible, to be compatible with the frequency and duration of flooding;
- g) minimize adverse effects on natural ecosystem and environment

M/S NESPAK produced first phase of the plan in the year 1978 which listed out primarily the current plans and proposals of the Provincial Governments and Federal Agencies. This phase estimated to cost of Rs. 6317 Millions (1978 price level) enunciated priorities and sequence of development for flood control works to be implemented over the next ten to twelve years viz upto the year 1989-90 and to undertake in this period the feasibility studies to deal with the intricate problems of the specific structures/ areas. The second phase of the programme which is still to be evolved will aim at refinement of the structural measures, enunciate strategies/policies and guide lines for the flood management and also indicate the programme for field observations, data collection and analysis.

The scope of works listed in the first phase of National Flood Protection Plan and overall coverage of the Flood management, entails a heavy outlay of expenditure on annual basis. Since such a big undertaking was beyond the meagre resources of the provinces, the responsibility for implementing the development works was assumed by the Federal Government from the year 1978-79 and since then the funds are being provided on quarterly basis to the four provinces every year as Grant-In-Aid from the Federal Budget. A comparison of the funds planned under the programme and allocations made on annual basis is given hereunder:—

Year	Plan provision	Funds made available.	(Rs. Million)
1979-79	251	115	
1979-80	270	145	
1980-81	350	200	
1981-82	420	275	
1982-83	476	266	
Sub total:—	1767	1001	
1983-84	500		
1984-85	550		
1985-86	600		
1986-87	650		
1987-88	700		
1988-89	750		
1989-90	800		
Grand total:—	6317		

As would be seen from para 8 above, the allocations so far have been about 57% of the planned provision. If the trend of low funding continues in the coming years also, the works envisaged under the programme will not be possible to complete within the plan period. The urgency to provide early coverage to public works against flood hazards is obvious and as such the budgetary allocations under the programme should be commensurate with the field requirements to meet the targets of the plan.

The schemes conceived under the programme are submitted by the provinces to the Federal Flood Commission which get them technically examined by the Standing Scrutinizing Committee having representation of the four Provincial Irrigation Departments, Water Wing of the Planning Division Islamabad and WAPDA. On clearance of the schemes by this Committee, normal procedure for securing the sanction of the competent authority at Federal level is governed as under:—

- (i) Schemes costing upto Rs. 05.00 million are approved by the Ministry of Water & Power.
- (ii) Schemes costing above Rs. 05.00 Million and upto Rs. 20.00 Million are approved by the Central Development Working Party.
- (iii) The schemes costing above Rs. 20.00 Million are approved by the ECNEC.
- (iv) Request for anticipatory approval is considered after the final version of the PC-I is cleared by the Federal Flood Commission as well as the Ministry of Water & Power. Only Chairman ECNEC holds the authority to accord such approval.

The implementation of works under the Plan has so far remained confined to the improvement of existing embankments or to reprovide protection to strategic areas exposed to danger by an undesirable development of the river courses. The works for long-term planning have still to be conceived and developed.

The areas in need of protection on account of development of unfavourable river courses usually come to notice during or after the flood season of the year. By the time the schemes for such areas are conceived and presented at Federal level, a portion of the useful working season is already through. The process of scrutiny at the Federal level leading to ultimate sanction of the scheme is also fairly time consuming and a major portion of the useful working season is usually lost in covering the procedural formalities.

ties. Again the release of funds on quarterly basis often gets delayed from the Federal channels. The implementation of river training works therefore receive a serious set back and quite often their on time completion remain in jeopardy. As the site conditions cannot be allowed to aggravate simply due to non-fulfillment of the procedural formalities at the Federal level, a change in the existing procedure of sanction and release of funds seems imperative. The remedy perhaps lies in following one of the following alternatives:—

- (i) After completion of the technical analysis of the scheme by the Standing Committee of the Federal Flood Commission, powers to accord approval should rest with the Federal Flood Commission i.e. the role of the Commission should be changed from recommendatory body into a functional institution; or
- (ii) The Federal Government should confine its authority upto making allocation of funds to the provinces on an agreed pro-rate basis while the powers of approving the schemes should rest at provincial level after the proposals are technically examined and cleared by the Scrutinizing Committee of the Federal Flood Commission.
- (iii) The funds under the programme should be placed at the disposal of the provincial governments on approval of the Federal Budget; alternatively the quarterly release of funds to the provinces by systematised for automatic flow.