DPR GUIDELINES FOR ERM OF IRRIGATION PROJECTS

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1.0 INTRODUCTION

Modernisation of Irrigation Project includes extension, renovation & modernisation components of existing project to optimize the benefits in view of the deficiencies experience in operation & maintenance of the project over the past years and as a result of technology advancements made during the period. This also takes into account the deterioration of the system due to lack of proper maintenance. Important aspects to be looked into are to review water availability, design flood, cropping pattern, water demand, operation and safety of the headworks & water distribution system. It would include measures for conjunctive use of water & drainage of surplus water. It also includes review & strengthening of agricultural support services & plan for involvement of beneficiaries in management of the project for self sustainability in future. The modernisation of irrigation projects inter-alia would mean upgrading the existing headworks, canals, command area development works etc. in view of experience gained and deficiencies felt in operation and maintenance of the project over the past years in order to derive optimum benefits for the present day irrigated agriculture.

While undertaking the modernisation of existing irrigation projects, the differentiation between restoration or rehabilitation vis a-vis modernisation needs to be understood. The restoration or rehabilitation of irrigation projects may include the works required to bring the canals components to their originally designed parameters i.e. restoring them to original sections and the canal capacities etc. The modernisation would be updating and improving the components to meet modern day concepts on safety and present day demand of water for irrigation, water supply and other diverse uses. The modernisation also includes extension of the existing system. The existing canals which were designed for traditional crops may be found wanting to meet the present day enhanced requirements of high yielding varieties of crops. Moreover, the old systems were mostly designed for protective irrigation. In order to meet the

rising demand of foodgrains, the concept of irrigation has undergone a major change from protective to productive irrigation. The productive irrigation implies that for any unit of water supply on a unit of land, the production should be optimum. Due to inadequate maintenance of the system for want of adequate funds, these have deteriorated and are required to be rehabilitated/restored in the first instance. Considering present day needs, these would also require to be modernised.

Most of the existing irrigation systems in the country were planned with unlined canals for traditional cropping pattern and assumed irrigation efficiencies. These systems are therefore, not able to cope up to the modern day agriculture and a lot of deficiencies like seepage losses, inadequacy of systems/canal structure to meet higher demands have been noticed. Modernisation of irrigation system does not mean merely improvement of the engineering parameters such as lining of canal and distribution system, improvement and modification of structures but also may include review of cropping pattern, crop water requirement, efficiencies of irrigation i.e. field application of water, remodelling/re- sectioning, re-aligning of canal, maintaining of required L Section and X Section of the canal and canal banks/berms. This would also include review of hydrology i.e water availability, design flood, sedimentation etc. & strengthening/remodelling of headworks if found necessary.

2.0 GUIDELINES FOR FORMULATION OF DPR FOR ERM PROJECTS: Detailed Project Report for ERM of Irrigation Projects have to be formulated as per following Guidelines(Guidelines for preparation of DPR of irrigation and multipurpose projects – prepared by CWC (2010)

GUIDELINES FOR PREPARATION OF DPR FOR ERM OF IRRIGATION PROJECTS

Section-1

CHECK LIST

I. Was the original project given investment clearance by Planning Commission?

2. Has the performance evaluation of the existing project been carried out?

3. Have the salient features of the project as envisaged at the time of execution of project and as at present, been indicated?

4. Have the irrigation potential of the existing project as originally envisaged, potential created and utilised and reasons for variations been indicated?

5. Has the culturable command area been actually assessed and compared with that at the time of planning of the project and shortfalls/excesses, if any, discussed?

6. Has he hydraulic survey of canal/distribution system been carried out?

7. Have the deficiencies m the existing irrigation system been identified?

8. Has the need for modernisation been justified?

9. Have the hydrological studies been reviewed, compared with those made at the time of preparation of the original project if available and reasons for variations recorded in respect of:

   (i) rainfall
   (ii) runoff
   (iii) flood
   (iv) sediment
   (v) ground water
   (vi) Evaporation

l0 (a) Have changes in the upstream withdrawals/diversions for industrial use, power generation, drinking requirement and other developments in the upper catchment to the extent

which can be collected with reasonable efforts been described?

(b) Have the changes in power generation/consumption in power for the lift irrigation scheme been described?

11. Have the semi-detailed soil surveys been carried out for the entire command (if not entire command tl)en extent covered) and soil and land irrigability classification brought- out in the report? (For the Project to be acceptable, semi detailed soil survey in at least 50% of command should have been carried out.)

12. Is the Crop Water Requirement determined by the modified Penmen method?

13. Have water requirements for other uses been worked out?

14. Has justification for the proposed cropping pattern been furnished?

15. Have the cropping pattern & proper cropping calendar been devised with a view to maximise the production and canal closures for maintenance etc. ensured? Have these been concurred by the Agriculture Department?

16. Are the areas and percentage of CCA that will be irrigated during Kharif, Rabi, two seasonal, hot weather and perennials been indicated and compared with cropping pattern as existing prior to taking of the project, originally envisaged and actually developed after completion of the project?

17. Is the justification furnished for continuing with/or taking up perennial and hot weather crops from the reservoir?

18. Have the most suitable depths and frequencies of irrigation to be adopted, based on the characteristics of the soil and crops been worked out?

19. Have the values of conveyance efficiency, field application efficiency and overall water use efficiency been indicated with basis thereof?

20. Has the pattern of releases (10 daily/monthly) from the diversion/storage headworks been worked out & compared with those envisaged originally?

21. Has the canal been red signed to cater for peak requirement with 10 percent increase (20% for small reservoirs) for rush

irrigation. If not, have the alternative proposals for carrying the required discharge been discussed?

22. Whether supplementation from ground water has been considered?

23. Are the supplies available sufficient to meet the requirements for ensuring 75 per cent dependability ? If not. have the possibilities of augmenting the supplies been discussed either by increasing the storage or supplementing by ground water etc.? Have the revised reservoir operation tables been furnished?

24. Has a study of the ground water potential of the command area. the present level of the ground water use and the scope of future ground water utilisation, been carried out and included in the project report?

25. Have the economics of ground water development been studied?

26. Has the possible impact on ground water recharge on account of lining of the system been kept in view in the scheme of ground water utilisation?

27. Has the possibility of the ground water for irrigating areas not commanded by the canal system been considered?

28. Has the quality of surface water as also ground water & drainage water, if intended for irrigation use, been tested?

29. Have the requirements of drainage in the command area, been studied and a suitable integrated drainage plan drawn up and provided for in the cost estimate?

30. Have the arrangements for the following been considered and provided for?

    (a) Execution of OFD works
    (b) Training programmes for field staff and farmers- existing position and proposals for strengthening
    (c) Participatory Irrigation Management (PIM), Water Users Associations (WUA), and turnover of the system to WUAs.
    (d) Pro-vision of extension services
    (e) Providing important inputs like seeds, fertilizers etc.

31. Have adequacy of road communication facilities and if not, the necessity of improvements been-discussed and provided for?

32. Have matters about the improvement in reliability/dependability of the annual irrigation in the existing/proposed command area been discussed in the light of modernisation?

33. Have the net benefits due to the project been estimated and concurred by the Agricultural Department?

34. Has the concurrence of the State Finance Department been obtained for taking up the project at the estimated cost?

35. Whether the scheme has already been started? If so, is the present stage of construction indicated?

36. Is the scheme included in the plan? If not, what is the present position regarding its inclusion in the plan?

37. Have the year wise requirement of funds been indicated?

38. Is the scheme covered under state sector or Central sector?

39. Is the schedule covered or proposed to be covered under any foreign assistance/aid agreement?

40. Are the detailed cost estimates included in the Report?

41. Has the benefit-cost ratio been worked out? Whether depreciated cost of completed works has been included in the calculations?

42. Whether Internal Rate of Return (IRR) has been worked out?

43. Are the financial returns attached?

44. Are there any special reasons to undertake the project if it is unproductive and whether these have been recorded in the Report?

45. Have the rates of betterment levy proposed, the period of recovery and the estimated total recovery been indicated?

46. Are there any charges levied for irrigation facilities as distinct from water charges?

47. Are the water rates for different crops indicated?

48. Have the rates of betterment levy, water charges, etc. been compared with those obtained in other regions of the State?

49. Has the concurrence of the State Revenue Department been obtained for these rates ?

50. Have the O&M aspects (both financial as well as management) been discussed? How are the O&M costs proposed to be met?

51. Have the programme of construction and the expenditure involved been furnished?

52. Has the requirement of staff been estimated and furnished with justification?

53. Has the adequacy of the existing irrigation laws and revision, if any, considered necessary been discussed?

54. Has the impact of the scheme on the overall development of water resources in the basin/state been discussed?

55. Whether views of water users about proposed works in modernisation project been obtained and described in the Report?

56. Have environmental/ecological aspects been discussed in the Report & environmental clearance obtained from MOEF?

57. Does the project involve acquisition of forest land? Has the MOE&F been approached for clearance under Forest Conservation Act 1980?

58. Does the project involve any re-settlement? Weather rehabilitation of PAPs provided for?

59. Does project involve rehabilitation of SC/ST population? Has the rehabilitation package for them been cleared by Ministry of Social Justice & Empowerment?

60. Have the socio economic studies (bench mark surveys) been carried out?

61. Have the interstate aspects been examined & discussed?

62. Have the list of ongoing programs of Agriculture Department in Command Area been given?

63. Have the provisions of Indus Water Treaty, 1960 for schemes on western rivers of Indus Basin been examined and discussed?

LIST OF DRAWINGS

I. Existing layout plan of the headwork and appurtenances with super imposed proposed changes.

2. Existing cross-section of earth/rockfill dam non-overflow concrete/ masonry power dam section, spillway, regulator etc. w ith super imposed changes in these sections.

3. Existing power generation /transmission network with super imposed changes in these sections, if any.

4. Contour plan of the sample command (scale I: l0.000 contour interval 0.5 m) showing the existing alignment of existing canal. location of structures. off-taking channels with details of discharge, bed level. FSL. both of the canal and the off-taking channel at the point of off-taking culturable command area under each channel etc.

5. Contour plan of the sample command (scale I:10,000 contour interval 0.5 m) showing the proposed alignment of the canal. location of structures off- taking channels with details of discharge, bed level, FSL both of the canal and the off-taking channel at the point of off-take, culturable command area under each channel .

6. Condensed existing L-Section of the canal showing the location of the existing structures, off taking channel, bed level, full supply level, bed slope and condition thereof.

7. Condensed L-Section of the canal showing the location of the proposed structures, off-taking channel, bed level, full supply level, bed slope etc.

8. Typical cross-section of the existing canal super-imposed with the proposed section.

9. Contoured layout plan, L-Section and Cross Section of major new/proposed to be remodeled canal structures with location of the bore hole drilled, pits excavated shown on the plan and the log on the cross-sections.

l0. Plan showing the classification of soils available in the command.

11. Land capability classification map of the command

12. Land irrigability classification map of command with boundaries of the area having different constraints and pre and post monsoon ground water contours.

13. Map showing existing area under irrigation and additional area proposed through modernisation.

14. Map showing the ground water potential areas.

15. Map showing the water logged and other problematic areas indicating the problems.

16. Map showing the sub-surface water quality in the command

17. Map showing depth to ground water in the Command Area (These maps are available with State/Central Ground Water Boards).