LECTURE 12

Irrigation Timing

- Maximum irrigation interval, (days)

$$T_{max} = \frac{AD}{ET_c}$$

- Actual irrigation interval, (days)

$$T = \frac{d_e}{ET_c}$$

d_e = effective depth of irrigation, (in. or mm)

ONFARM DEVELOPMENT AND COMMAND AREA DEVELOPMENT

Definition:

- The distribution Network in the ayacut area below irrigation sluice is called micro distribution systems and component works below the outlet is called “On Farm Development”.
- On-farm development may be defined as any development in the farm, particularly those related to making it more efficient and optimal in return.
- On- farm water management is one of the major components of on-farm development works in India. This mainly includes improving or modifying filed to field irrigation.

OFD Components of water Management include:

- Design of irrigation channel in each farm or for a block of farm, facilitating unhindered flow of water.
- On-farm water distribution structures such as checks, outlets, division boxes, energy dissipators.
- On farm water course improvement and lining.
- Land leveling with objective of improving drainage, preventing soil erosion.
- Earthen bunds.
- Field drains.
- Land leveling and shaping.

Field drain at village Indas (Salandi Right Canal)

Field channel at village Sahadevpur
(Mahanadi-Delta Stage- I)

Field channel construction work under progress in Tikarapali

COMMAND AREA DEVELOPMENT :

- Main Objective of command Area Development Programme is to reduce the gap between irrigation potential created and actual irrigation utilised.

Agencies:

1. Command area Development authority
2. Agricultural Engineering Department
3. CADA wing of Irrigation departments
4. CADP wing of P.W.D

Funding from government of India GOI:

- CAD establishment – Matching grant about 20% of total expenditure.
- Survey, planning and Design – Matching grant.
- Field irrigation channel – 20%.
- Field drains: - GOI pays Rs. 500 per ha.
- Warabandhi – Matching grant. For design of outlets, wireless. communication etc., at Rs 150/ha.
- Reclamation of water logged area- Matching grant at Rs. 600 per ha.
- Crop compensation: - Matching grant. Paid 2/3 of crop value.
- Adaptive trial: - Matching grant.
- Demonstration and training.

TAMIL NADU SCENARIO

- In Tamil Nadu, CADA is implemented in Cavurey command, lower Bhavani project, Parambikulam Aliyar project Kodiyar Chitter- Pattanamkal project, Cumbum valley, Periyar Vaigai Project.Sathanur and Tambiraparani River basin Project.Rs.90 corers has been invested by TN government to implement command area development Programme during Ninth Five year Plan.

- Tamil Nadu has 10.79 Lakh has of command area out of which 8.85 Lakh ha has been covered this programme.

- On farm development was implemented in 12 command areas.Rotational water supply has been introduced in 9 command areas.

- During Tenth five year, OFD and Rotational water supply is programmed to be taken up water supply is programmed to be taken up in CADA in 10 commands viz:

ON FARM STRUCTURES ON FIELD CHANNELS

- Measuring devices – V notch, parshall flume, weirs etc.
- Drops or falls
- Division or distribution boxes
- Turnouts
- Culverts, cart tracks, threshing floors.

Well defined OFD works :

- To ensure timely, adequate and dependable water supply to farm
- To ensure an equitable distribution of water
- To ensure the system can optimize the efficiency of irrigates
- To ensure that the system is acceptable to farmers. They are adequately involved in the system.

PARTICIPATORY APPROACH

- Participatory Approach is crucial for management of irrigation projects for conserving and optimal utilization of resources
- Participatory Irrigation Management (PIM) refers to involvement of irrigation users in all aspects of Irrigation Management and at all levels
- Water Users' Association (WUA) has been registered for the purpose in various states in India

Participatory Irrigation Management

- The State Government has to create an enabling environment through policy resolutions, specific programs, projects and activities to be implemented or sponsored by the government,
- Providing intellectual, administrative an implementational leadership,
- Putting into place legal and administrative provisions and procedures,
- Undertaking mass awareness building an promotional efforts,
- Providing technical advice and technical back up, as well as funds, to WUAs for selective activities,

- Ensuring attitudinal and behavioral change amongst employees of all government departments directly or indirectly concerned
- with Tank, Canal (and Community Lift) irrigation,
- Creating nodal points of PIM in all concerned government departments both at the Central Government and State Government levels
- Preparing guidelines and field manuals
- Arranging for various sorts of PIM related training
- Helping WUAs to rehabilitate old irrigation systems to bring them up to at least a minimum operational level
- Involving NGOs and Community Organizers
- Providing incentives, monetary, or otherwise for (i) farmers to undertake PIM, and (ii) government staff to facilitate it((p) helping WUAs in conflict resolution with other agencies

Definition of Water Users Association

- A Water Users Association (WUA) is a co-operative association of individual water users who wish to undertake water-related activities for their mutual benefit.
- Member needs will differ from one area to another, a WUA is normally established in response to the aspirations of its members

Scope of WUAs

- An efficient and equitable supply and distribution of water ensuring optimum utilization for improvement of agricultural production.
- Scientific and systematic development and maintenance of irrigation infrastructure.
- Management and maintenance of the irrigation system for effective and reliable supply and distribution of water.
- Play coordinative role in recovery of irrigation water rates from the beneficiary farmers.
- The protection of the environment and ecological balance

Scale of Operation of WUAs

- WUAs differ enormously from one another in their geographical scale of operation. One reason for this is that they are often federated upward in up to three tiers, each of which covers an area of operation of an entirely different order and performs substantially different functions for its members or member organizations.

Functions of WUAs: Core functions

1. Acting as an interface between the farmers and the main system management .
2. Water distribution.
3. Operation and maintenance of the irrigation and drainage system.
4. Collection (and assessment) of water charges and other user charges or special charges that the WUAs may levy.
5. Resolution of local disputes amongst members.
6. Conflict resolution between members and nonmembers
7. Drainage
8. Provision of drinking water from canals
9. Design and construction of new works as well as rehabilitation of canals and structures
10. 10 Maintenance of commercial, financial and water accounting records
11. Cooperating with other WUAs to form federations of WUAs to take over larger canal sub-systems

The additional and optional tasks could be as follows:

- Recommending of cropping patterns and package of agricultural practices suitable for the WUA's farmers.
- Helping to arrange for other inputs, to members for undertaking irrigated agriculture.
- Irrigation extension and propagation of better onfarm water application and farm better intra-outlet command water management.
- Agriculture extension and farmers training.
- Encouraging and taking up of conjunctive water use, including community lift irrigation.
- Post harvest practices (grading, packaging, storage, marketing).
- Any other task as mutually agreed upon by the members.

FLOODING MANAGEMENT IN IRRIGATION ASPECTS

- Construction of flood protection structures
- Improvement of drainage efficiency
- Desilting, cleaning of road, bell mouth, gullies, removal of debris, solid waste materials from all drains.
- On-channel storage of Rain Water in storm drains
- Artificial Recharge Trenches
- Providing Retention basins,checkdams.

- Creation/Revival of water bodies
- Rain Water Harvesting Structures
- Flood-plain management
- Planting sturdy trees sustaining draught as well flooding
- Land use and development planning
- Development and deepening of village ponds:

Economical aspects of irrigation

- Irrigated lands permit sustained growth of valuable moisture-loving crops
- Organization of agricultural production in irrigated land, with allowance for market conditions, permits a farmer to obtain a higher profit
- The perfection of existing irrigation systems accompanied by an increase in material and financial expenditure, as compared to the establishment of new irrigation systems on additional areas;
- The construction of facilities on inhabited land generally favors the organization of a new setting system, transforms lifestyles on the newly developed land, and creates new jobs for the economically active population.

IRRIGATION ENGINEERING

- The involvement of human, water, and land resources into economic activity on the same developed area significantly stimulates the economy, both in the irrigated zone and beyond
- The need to avoid or mitigate negative environmental effects of Irrigation system installations and of irrigation itself increases the capital intensity of an irrigation project;
- The main legal entities in the irrigation water market are those involved with carrying out the day-to-day management of hydrosystems including water sources, large-scale water supply arteries (conveying channels) feeder structures, and different protective units (flood control, storm-water management, dewatering, coast-protection, etc.