**Water Resources Department (WRD),**
**The State of Rajasthan,**
**Republic of India**

# THE PREPARATORY SURVEY
# ON
# RAJASTHAN WATER SECTOR LIVELIHOOD IMPROVEMENT PROJECT

## FINAL REPORT
## Advanced Version
## Volume – II Attachments

**February 2017**

**JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)**

**NIPPON KOEI CO., LTD.**

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# The Preparatory Survey
# on
# Rajasthan Water Sector Livelihood Improvement Project

## List of Attachments

# *Chapter 2*
# *Attachment*

# *Attachment 2.1.1*
# *National Water Policy*

## Attachment 2.1.1 National Water Policy

### (a) Basic Principles

Basic principles that govern the NWP includes:

- The principle of equity and social justice must inform the use and allocation of water;
- A common integrated perspective should govern the planning and management of water resources. Such a perspective would consider local, regional and national context and have an environmentally sound basis;
- Water needs to be managed as a common pool community resource that is held by the state under the public trust doctrine to ensure equitable and sustainable development for all.
- Water may be treated as an economic good to promote its conservation and efficient use after basic needs such as those of drinking water and sanitation are met; and
- River basin should be considered as the basic hydrological unit for the purpose of NWP.

NWP makes recommendations on several issues such as adapting the availability of water to climate change, water pricing and conservation of river corridors, water bodies and infrastructure. NWP priorities water allocation are :

i) Drinking,
ii) Irrigation,
iii) Hydropower,
iv) Navigation, and
v) Industrial and other uses.

### (b) Main Features of NWP

Main features of NWP are:

- Increasing water storage in the forms of soil moisture, ponds, ground water, small and large reservoirs.
- Enhancing the efficiency of water use through the adoption of agricultural strategies, cropping patterns, and improved water management, such as land leveling and micro irrigation.
- Stakeholder participation in land-soil-water management with scientific inputs from local research and academic institutions to evolve different agricultural strategies, reduce soil erosion and improve soil fertility.
- Declining ground water levels in over-exploited areas need to be arrested by introducing improved technologies of water use and encouraging community based management of aquifers. Additionally, artificial recharging projects should be undertaken so that more water is recharged rather than extracted from aquifers.
- Inter-basin transfers of water from surplus basins to deficit basins/areas need to be encouraged to increase the production of water.
- Integrated watershed development activities with groundwater perspectives need to be undertaken to increase soil moisture, reduce sediment yield, and increase overall land and water productivity. Existing programs such Mahatma Gandhi National Rural Employment Guarantee Act may be used by farmers to harvest rain water using farm ponds and other soil and water conservation measures.
- Systems to benchmark water use, such as water footprints and water auditing, need to be developed. Continuous water balance and water accounting studies need to be conducted to improve the efficiency of water use from irrigation projects and river basins.
- Water needs to be saved during irrigation. Methods to encourage water saving include, aligning cropping pattern with natural resource endowments, micro irrigation (drip, sprinkler, etc.), automated irrigation operation, and evaporation-transpiration reduction. Canal seepage water can also be recycled through conjunctive ground water use.
- Small local level irrigation through small bunds, field ponds, agricultural and engineering methods for watershed development, need to be encouraged.
- Users of water should be involved in monitoring the pattern of water use if it is causing problems like unacceptable depletion or building up of ground water, salinity, alkalinity etc.

- A Water Regulatory Authority should be established in each state. The authority will be responsible for fixing and regulating the water tariff system and charges to be levied.
- Water charges should be determined on a volumetric basis.
- To keep aside a portion of river water flow to meet the ecological needs and to ensure that low and high flow releases correspond in time closely to natural flow regime.
- Recycle and reuse of water should be incentivized through a properly planned tariff system.
- Water Users Associations (WUA) should be given statutory powers to collect and retain a portion of water charges, manage the volumetric quantum of water allotted to them and maintain the distribution system in their jurisdiction.
- Conservation of river corridors, water bodies and infrastructure needs to be undertaken in a regulated and scientifically planned manner through community participation.
- Pollution of sources of water and water bodies should not be allowed.
- Legally empowered dam safety services need to be ensured in the centre as well as states.
- All clearances, including environmental and investment clearances, required for implementation of projects should be made time bound to avoid the economic losses incurred due to delays in implementation.
- To avoid time and cost over-runs, concurrent monitoring at project, state and central levels should be undertaken for timely interventions.
- Local governing bodies such as *panchayats*, municipalities, corporations, and WUAs should be involved in the planning of projects.
- Flood forecasting needs to be expanded to the rest of the country and modernized using real time data acquisition system.
- Operating procedures for reservoirs should be evolved and implemented so as to have a flood cushion and reduce trapping of sediment during flood season.
- Frequency based flood inundation maps should be prepared to evolve coping strategies. Communities should be involved in preparing an action plan for dealing with floods/droughts.
- Efforts should be made to provide improved water supply in rural areas with proper sewerage facilities. Least water intensive sanitation and sewerage systems with decentralized sewage treatment plants should be incentivized.
- In urban and industrial areas, rainwater harvesting and de-salinization should be encouraged to increase availability of utilizable water. Urban water supply and sewage treatment schemes should be integrated and executed simultaneously. Water supply bills should include sewerage charges.
- Subsidies and incentives should be implemented to encourage the recovery of industrial pollutants and recycling, which are otherwise capital intensive.
- A Permanent Water Disputes Tribunal should be established at the centre to resolve disputes expeditiously.
- Communities should participate in the management of water resource projects and services.
- Integrated Water Resources Management should be the main principle for planning, development and management of water resources.
- Riparian (along the banks of rivers) states should be consulted during negotiations about sharing and management of water of international rivers keeping national interests in mind.
- A National Water Informatics Centre should be established to process hydrological data regularly from all over the country. All hydrological data should be put into the public domain.
- Grants should be given to states to update technology, design practices, and planning and management practices.
- To meet the demand of skilled manpower in the water sector, regular training and academic courses in water management should be promoted. A national campaign for water literacy needs to be started for capacity building of stakeholders in the water sector.

NWP contemplates paradigm shift in approach from service provider of water to facilitator of services. Effective intuitional and administrative mechanisms are necessary to deal with the ever escalating, conflicting, competing and well articulated demand for water. NWP states that for cost effective

development and optimal utilization of water, it is necessary to formulate projects within the framework of an overall plan treating hydrologic basin /sub-basin as a unit for purpose of development. To achieve this objective, necessary institutional mechanism can be created through minor and simple amendments in the relevant acts in vogue.

# *Attachment 2.1.2*
# *State Policy Reforms in Water Sector*

## Attachment 2.1.2 State Policy Reforms in Water Sector

The Government of Rajasthan (the GoR) plans to implement SWP within a long term programmatic framework for introducing water sector reforms.

Planning and policy formulation is a dynamic process and for any policy to be successful a regular review and timely refinement/modification is necessary. In order to achieve the goals certain policy reforms are needed in water sector. As such following policy reforms have been initiated:

- Adoption of state water policy incorporating farmers' participation in irrigation management,
- Adoption of Resettlement and Rehabilitation (R&R) policy in accordance with National R&R Policy 2007,
- Enactment of a legal act to facilitate farmers' participation in irrigation management,
- Ensure improved O&M of irrigation system & expenditure prioritization for O&M, and
- Strengthening Water Resources Planning & Environmental sustainability while planning for water development projects.

The concept of rehabilitation of the persons displaced by the construction of a project was originally missing. The displaced persons were paid the price of land and property acquired by the Government in accordance with the Land Acquisition Act and very little attention was paid to their resettlement and rehabilitation. It has now been recognized that it is the responsibility of government to suitably rehabilitate the displaced persons. R&R policy for all the state's water resources development projects was adopted by GoR in October 2000. Directorate for Resettlement and Rehabilitation was also established in WRD in the year 2002. Subsequently, GoR has adopted (June 06, 2011) National Resettlement and Rehabilitation (R&R) Policy 2007 to address R&R issues in infrastructure development projects across all sectors in the state. Resettlement /rehabilitation of families affected by new projects is being done by project authorities in close coordination with district revenue officers and the principles laid down the R&R policy are being followed.

The Government of Rajasthan has already taken up the following institutional reforms in the water resources sector so far:

- A 'Rajasthan River Basin and Water resources Planning Authority' has been established in the year 2015 to adopt an integrated Water Resources Management approach for management and development of river basins and sub-basins on sustainable basis by planning of all watershed, irrigation and drinking water projects covering basins, sub-basins aquifers and watershed to develop state level resource plan to ensure optimal and efficient utilization of ground and surface water including inter basin water transfer, interlinking of rivers from surplus to deficit basins, sub-basins.
- A State level 'Rajasthan State Water Resources Advisory Council' under the Chairmanship of Chief Minister has also been constituted. This council over views and decides about the policies for water resources development in the State. The Ministers and Secretaries of the relevant departments, and experts are members of this Council.
- A Standing Committee on State Water Resources has been constituted under the Chairmanship of Chief Secretary. The Secretaries of various departments related to water resources and the heads of the departments along with farmer's representatives are members of this Committee. The committee works as a unified agency, which has complete control over water resources development activities in the State and ensures proper co-ordination between the various development and user departments.
- As a part of long-term planning of scarce water resources of the state, a separate State Water Resources Planning Department (SWRPD) has been created with adequate staff. SWRPD is the secretariat for council / committee constituted by GoR for overseeing policy framing, utilization, planning and development of water resources (i) State Water Resources Council (SWRC) chaired by the Chief Minister and (ii) Standing Committee on State Water Resources chaired by Chief Secretary. In conformity to state water policy, all the new water utilization projects are being cleared by SWRPD after assessment of the water availability in the basin.
- R&R policy for all the state's water resources development projects was adopted by GoR in

October 2000. Directorate for Resettlement and Rehabilitation was also established in WRD in the year 2002. Subsequently, GoR has adopted (6 June 2011) National Resettlement and Rehabilitation Policy 2007 to address R&R issues in infrastructure development projects across all sectors in the state.

- As a part of capacity building of water sector institutions, framework has been developed to present training needs across all the levels and different functional area of management under water sector. For the purpose of the training of the framers, officials of WUAs and trainers, two Institutes i.e. IMTI Kota and Water and Land Management Institute (WALMI) at state level have been strengthened. These institutes cater the training needs on water management related issues.
- "Field Operational Manual for the Environment Management in Water Resource Projects" for the Rajasthan State for guiding the field staff of the WRD Rajasthan to mainstream environmental management from planning, implementation to O&M stages in Water Sector projects has been developed and disseminated to all the staff through workshops.
- New, Water Resource Information System has been designed to handle both regular and ad-hoc queries to automate the process of generating reports. Development of web based GIS enabled 'Water Resources Information System' (WRIS). WRIS is a repository of data and processed information of wide spectrum of water resource domain pertaining to state of Rajasthan. WRIS enables users and stakeholders to maintain up-to-date information on projects, dams, reservoirs, canals, anicuts, surface and ground water resources including recharge, chemical analysis and water quality of available water, crop. WUAs etc. WRIS was launched in July 2011.
- Earlier, the management of irrigation systems was being done under the provisions of Irrigation and Drainage Act, 1954 and Irrigation and Drainage Rules, 1955. This act states that operation and maintenance of irrigation systems, collection of irrigation revenues and equitable distribution of water is the prime responsibility of Irrigation department. Subsequently, as a part of major reform initiative in the water sector GoR enacted the Rajasthan Famers' Participation in Management of Irrigation System (RFPMIS) Act 2000 (November 20, 2000) and notified RFPMIS Rule 2002 (October 22, 2002) enabling formation of WUAs (please refer to Section 2.4.1). WUAs are being formed on selected projects to take over management and maintenance of minor canal level of irrigation system for efficient and economical use of water. Thus WRD is acting as facilitator. GoR has also issued order that 50 percent of collected water charges/tax distributed amongst Water Users' Association, Distributary Committee and Project Committee for maintenance of the system under their control. WUAs would also be formed on the irrigation projects proposed under this project.
- State government introduced 'Integrated Finance Management System – IFMS' for budgeting and accounting purpose. When Integrated Finance Management System was launched, it was launched without Letter of credit (LC) functionality (used by state works department only). Now, Government of Rajasthan is making this function also available from 1st April 2013 onwards.
- GoR has also authorized WUAs to undertake water conservation / harvesting, irrigation and restoration of traditional water bodies. GoR has proposed convergence of the rehabilitation activities under the project with MGNREGA by providing employment in rural sector under MGNREGA for Rehabilitation of canals having discharge less than 5 cusecs (0.14 $m^3/s$) as well as rehabilitation of watercourses through agency of WUAs.

# *Attachment 2.1.3*
# *National Policy for Agriculture*

## Attachment 2.1.3 National Policy for Agriculture

### (a) The Salient Features of Agricultural Policies are;

i) Greater private sector participation through contract farming.
ii) Price protection for farmers.
iii) Dismantling of restrictions on movement of agricultural commodities throughout the country.
iv) Rational utilization of country's water resources for optimum use of irrigation potential.
v) High priority to development of animal husbandry, poultry, dairy and aquaculture.
vi) Capital inflow and assured markets for crop production.
vii) Exemption from payment of capital gains tax on compulsory acquisition of agricultural land.
viii) Minimum fluctuation in commodity prices.
ix) Adequate and timely supply of quality inputs to farmers.
x) High priority to rural electrification.
xi) Setting up of agro processing units and creation of off farm employments in rural areas.

### (b) Sustainable Agriculture:

The policy will seek to promote technically sound, economically, viable environmentally, non degrading and socially acceptable use of country's natural resources-land, water and genetic endowment to promote sustainable development of agriculture. Attention will be given for increasing cropping intensity through multiple cropping balanced and conjunctive use of biomass, organic and inorganic fertilizers and controlled use of agrochemicals through integrated nutrient and pest management (INM and IPM) will be promoted to achieve the sustainable increases in agricultural production.

### (c) Food and Nutritional Security:

Efforts will be made to raise the productivity and production of crops to meet the increasing demand of food and raw materials for expanding agro based industries.

A major thrust will be given to development of irrigated horticulture, aromatic and medicinal plants, bee keeping and sericulture for augmenting food supply, exports and generating employment in rural areas.

Animal husbandry and fisheries also generate wealth and employment in agriculture sector. Development of animal husbandry, poultry, dairying and aqua culture will receive high priority in the efforts for diversifying agriculture increasing animal protein availability in the food basket and generating exportable surpluses.

### (d) Generation and Transfer of Technology:

The research and extension linkage will be strengthened to improve quality and effectiveness of research and extension system. Role of Krishi Vigyan Kendra (KVK's), Non Governmental Organizations (NGO's), Farmers Organizations, Co-operatives, Corporate Sector and Para-Technicians in agriculture extension will be encouraged for organizing demand driven production systems. Development of human resources through capacity building and skill up gradation of public extension functionaries and other functionaries will be accorded high priority.

### (e) Inputs Management

Adequate and timely supply of quality inputs such as seeds, fertilizers, plant protection chemicals, bio pesticides, agricultural machinery and credit at reasonable rates to farmers will be endeavor of the government. Soil testing and quality testing of fertilizers and seeds will be ensured and supply of spurious inputs will be checked. Balanced and optimum use of fertilizers will be promoted together with use of organic manures and bio fertilizers to optimize the efficiency of nutrient use.

### (f) Incentives for Agriculture

The government will endeavor to create a favorable economic environment for increasing capital formation and farmer's own investment by removal of distortions in the incentive regime for agriculture improving the terms of trade with manufacturing sectors and bringing about external and

domestic market reforms backed by rationalization of domestic tax structure. Appropriate measures will be adopted to ensure that agriculturist by and large remain outside the regulatory tax collection systems. Farmers will be exempted from payment of capital gains tax on compulsory acquisition of agricultural land.

**(g) Investments in Agriculture:**

The agriculture sector has been starved of capital. There has been decline in the public sector investment in the agriculture sector. A time bound strategy for rationalization and transparent pricing inputs will be formulated to encourage judicious input use and to generate resources for agriculture.

Bridging the gap between irrigation potential created and utilized, completion of all ongoing projects, restoration and modernization or irrigation infrastructure including drainage, evolving and implementing an integrated plan of augmentation and management of national water resources will receive special attention for augmenting the availability and use of irrigation water.

Emphasis will be laid on development of marketing infrastructure and techniques of preservation, storage and transportation with a view to reducing post harvest losses and ensuring a better return to the grower.

# *Attachment 2.1.4*
# *State Policy for Agriculture 2013*

## Attachment 2.1.4 State Policy for Agriculture 2013

State have framed state agriculture Policy 2013 to ensure food and nutritional security and economic empowerment and doubling the production of food grains in the next 10 years to attain a minimum 4 per cent of agriculture per annum.

### (a) The Vision of Agricultural Policy

The vision of Agriculture Policy of Rajasthan will be to ensure food and nutritional security and economic empowerment of the people through accelerated yet sustainable growth in Agriculture. Agriculture policy shall strive for doubling the production of food grains in the next 10 years and to obtain a minimum of 4% agriculture growth per annum.

### (b) Social Justice and Equity

To ensure social justice and equity, food and nutritional security will be given high priority to ensure a balanced diet for all, the policy will promote fruit and vegetable production and their consumption in rural areas.

### (c) Fodder Security

To achieve fodder security to meet the demand of live stock population which is increasing by 4% annually, and is expected to be around 8.68 *Crore* by 2020. This shall be ensured by promoting fodder crops and fodder and feed storage systems. This shall be ensured by promoting fodder crops and fodder and feed storage systems.

### (d) To Bridge the Existing Yield Gap

To bridge the existing yield gap through adoption and up sealing of improved technologies involving public, private and community approaches for extension delivery and input availability.

### (e) Water Management

To promote best practices in water management system that save water at least by 30 per cent and increase in productivity.

### (f) Greening

To make grey areas green through adoption of new technologies, including scientific land use planning and integrated farming systems mode.

### (g) Increase of Farm Income

To increase farm income by initiating measures to minimize cost of cultivation increase productivity encourage rural base agro processing and value addition and to link farmers to the market.

### (h) Increase of Productivity

To enhance productivity of crops of cereals, pulses, oil seed and seed spices etc.

### (i) Diversification of Agriculture

To promote much needed diversification of agriculture specially crops like seed spices medicinal crops, horticulture, animal husbandry, dairying, bee keeping, agro forestry and in land aqua culture.

### (j) Specialty Crops

To encourage individual, joint or contract farming for specialty crops in order to ensure higher income through efficient production, processing and export of value added commodities.

### (k) Improvement of Rural Livelihood

To discourage migration, both seasonal and permanent of rural people of urban areas through various means of improved rural livelihood and income generation through on farm and off farm opportunities.

**(l) Long Term Investment**

To accelerate capital formation in agriculture through long term public and private investments including development of infrastructure such as silos, cold chain and agro based processing industries.

**(m) Strategy:**

i) Integrated farming system approach especially for dry land Agriculture
ii) Organic farming.
iii) Micro Irrigation
iv) Integrated Nutrient Management (INM)
v) Integrated Pest Management.(IPM)
vi) Farm Mechanization.
vii) Fodder Production.
viii) Ensure the Quality of inputs like fertilizer insecticides and seeds.
ix) Infrastructure Facilities
x) Alternate energy – Utilization of renewable energy mainly solar.
xi) For extension support and capacity development.
xii) Improving the livelihood of farmers crop-horticulture-live stock integrated farming system's and creating better livelihood options through agro processing and value addition will be promoted.
xiii) Credit support – credit at lower interest rate will be insured to all small farmers in the state.
xiv) Gender - Mainstreaming: Women empowerment in agriculture will be a major thrust of the policy. Special programme for women empowerment in agriculture sector, especially targeting maternal and child health care to overcome their drudgery and to provide them proper education/training/skills associated with required incentives will be launched.
xv) Capital formation and investment in agriculture for diversification – The strategy under this policy emphasis major effort towards diversification of agriculture. But diversification is not to be parochially in terms crops alone but would encompass composite agriculture having crops, horticulture, live stock, fisheries and secondary agriculture. Switching from traditional crop cultivation to horticulture, for example would require more investments on cold chain including cold storage ware houses, processing units and marketing network.
xvi) Organization and Management Reforms – Farmers meet to be linked to markets. They need to have a role in deciding the price of a commodity and be enabled to do so through co-operative, self help groups (SHGs) and civil societies.

*Attachment 2.1.5*
*Summary of State Action Plan*

# Attachment 2.1.5 Summary of State Action Plan

Farmers of the state of Rajasthan will have to be encouraged to take step from subsistence agriculture to modern consumer and market oriented production to modern consumer and market oriented production to modern consumer and market oriented production only in that way it will be possible to achieve higher and sustainable farm income, higher efficiency in utilization of scarce natural resources of which water is the most important one.

The government agencies and institution in charge of agricultural development are first and foremost.

- The Department of Agriculture (DoA) followed by
- The Department of Horticulture (DoH)
- The Department of Livestock (DoL) and
- Krishi Vigyan Kendra (KVK)

The roles of the governmental agencies and of KVK are related to disseminating know how to farmers at various level and support the development by provision of subsidies. Dissemination of know-how and promotion of new techniques and equipment will be achieved by field demonstrations.

The three government agencies are well established at each district capital.

### (1) On and Off Field Demonstrations

Field demonstrations will be arranged by DoA and DoH complemented by class room and practical training at KVK centers.

### (2) Crops and Crop Diversification (through DoA)

Water saving in irrigation is of paramount importance in mitigating the problems arising on account of monoculture. Glaring example of crop diversification are, Soybean in Kota, Baran, Jhalawar, Chittore and Banswara winter maize in Banswara and Isabgol in Bikaner, Barmer, Nagaur, Jodhpur, Jalore, Jaisalmer and Chittore. Water wise crops (Crops of low water demand) like Gram, Lentil, Mustard, Linseed and Isabgol can be tried for demonstration on crop diversification.

### (3) Cultivation of Vegetables and Fruits

Keeping in view location, climate, soil access to market and experience of DoH, cultivation of vegetables as well as the establishment fruit orchards e.g. Orange, Guava, Mango, Custard, Apple, Dat Palm, Pomogranate and Ber (Zizyphus Mauritians) can be done.

Field demonstrations on vegetable productions can be organized in selected WUA's. Major advantage of fruit trees are the higher market value, less water requirement by the use of drip irrigation, inter cropping during initial years of establishment can be practiced.

### (4) Organic Farming (through KVK & DoH)

Organic farming is a holistic approach, which promotes and improves biodiversity, nutrient biocycles and soil microbial and biochemical activities. Organic produce fetch better market

prices hence increase farm income. Currently DoH is providing subsidy of Rs. 10,000 per hectare for organic farming of vegetables & fruits. Subsidy is provided in three years in 40:30:30 ratios.

**(5) Integrated Nutrient Management (INM) (through DoA, DoH and KVK)**

The degeneration of soil fertility owing to over mining nutrients. Critical analysis of available information shows that problems of degradation of soil health and ground water pollution are caused due to imbalanced fertilizer use and inadequate use of organic manures.

Use of organic manures with balanced application of fertilizer can alleviate the emerging problems of micronutrients deficiency. DoA may initiate demonstrations and supervise the demonstration on INM in crops and DoH in vegetable crops and fruit orchards.

**(6) Integrated Pest Management (IPM) (through DoA, DoH and KVK)**

Indiscriminate use of pesticides affects the ecological balance, resulting pest resurgence, pesticide resistant, pollution of environment and accumulation of pesticide residues at toxic level in food chain. Demonstrations on IPM are essential for sustainable environmental friendly, agriculture production. DoA will initiate and supervise the demonstration on IPM in crops and DoH in vegetable crops and fruits.

**(7) Poly-tunnels, Green Houses and Agro Shade-net House**

The advanced form and intensive form of horticulture (DoH) is providing subsidies for promoting the construction of green houses and the use of poly tunnels (high as well as low polythene tunnel) and "Agro-Shade net houses for raising in off season in small areas. This type of protected farming is entirely for production of marketable produce of high value. Due to enclosed environment water demand is relatively low due to very low evapo transpiration. Poly tunnels, Green Houses and Agro-Shade-Net houses will be useful for the farmers.

**(8) Irrigation Methods (through DoA and DoH)**

Higher irrigation efficiency at farm level requires uniform application of water at the proper time and in the proper amount. Under overwhelming conditions of water scarcity only water saving methods of irrigation should be promoted such as low pressure mini-sprinkler and drip irrigation systems. Rajasthan has no other recourse but to take the path of more crop and income per drop of water. Pressurized irrigation promotion is the only option and hence shall be promoted in the fields of farmer. Sprinkler system is an important method of pressurized irrigation method. This system saves 30 to 40 per cent irrigation water. Subsides are provided to farmers by DoA and DoH for sprinkler systems of irrigation. In drip system of irrigation water is applied in drops which cause root zone wetting. This system of irrigation enhances water use efficiency but is also enabling effective use of nutrient for higher productivity, especially through fertigation. DoH is providing subsidies to farmer for drip irrigation. Field demonstration therefore, must also be related to proper installation of sprinkler and drip lines, on measurements of discharge of nozzle and emitter, cleaning of nozzle and emitters and of filters.

**(9) Surface Irrigation (through DoA)**

To promote efficient water management practices, surface irrigation methods like: Check basin, furrow and border strip method should be adopted. Irrigation efficiencies of these methods are at 40 to 60% ie. By more than 30% higher than so called wild flooding which is still practiced at too many places. Field demonstrations be carried out in WUA.

**(10) Sprinkler Irrigation (through DoA)**

In particular low pressure sprinkler systems driven by solar powered pumps should be promoted and subsidized. Low pressure systems should be preferred consuming less energy and thus can be powered by solar pumps. Field demonstrations should be organized at WUA area at least over a period two years.

**(11) Pipelines**

The introduction of pipelines to supply water to the edge of the field either by for surface irrigation or for pressurized systems which has proved to be water saving. DoA estimated that 20-25% of losses can be saved by using pipelines. Hence the supply of pipelines as a water saving means is most recommendable. DoA is providing subsidy for the purchase of pipelines.

**(12) Drip Irrigation Systems (through DoH)**

It is pertinent that root zone wetting through drip irrigation will lead to efficient use of scarce water resources. Drip irrigation is the most water saving irrigation method to date. However, it is only economically applicable in vegetable row crops and in orchards. Demonstrations with drip irrigation should be include the application of liquid fertilizer through drip system. DoH is providing subsidy to farmers for drip irrigation. To avail subsidies for solar powered pump, installation of drip irrigation system is essential.

DoH assists farmers in planning and installation of drip irrigation and solar driven pumps.

**(13) Livestock Rearing**

Livestock production is an integral part of farming and contributes substantially to nutritional security and poverty alleviation through increased house hold income. Farmers in Rajasthan state are largely dependent upon dairy farming and small ruminants like goat and sheep. The total number of livestock in currently 5.77 crore of heads, which is almost comparable that of human population of the state. Demonstration on fodder crops like Berseem, Lucerne, Oat and multi cut sorghum will be useful for the farmers of the projects.

Thar parkar, Rathi and Gir are important breeds of milch type cattle. Murrah and Surti are breeds of milch type buffalo.

Goats are a multiple purpose animal. There are 21.50 million heads of goats in Rajasthan. Rajasthan is having 11.18 million sheep. Farmers can generate income through their meat, milk, wool and manure. Currently farmers are facing the difficulty for marketing of Goat and Sheep.

30% of India's mutton comes from the finest breeds of goat of Rajasthan like Sirohi, Marwari and Jhakrana.

The state has eight well defined breeds of Sheep-Chokla, Magra, Nali, Pugal, Marwari, Malpura, Sonadi and Jaisalmeri. These produce nearly 35% of India's wool.

Currently farmers are facing difficulty for marketing of goat and sheep.

The National Research Institute for Goat at Mathura (U.P.) is imparting training to farmers in goat rearing.

**(14) Modern Farm Machinery and Tools (through DoA and DoH)**

Rapid increase in agriculture mechanization helped in increasing the crop production. Modern farm machinery helps in increasing the crop production and decreasing the cost of production. Generally farmers using modern farm machinery to achieve higher crop productivity.

Use of modern farm machinery like disc plough, seed drill, seed cum fertilizer drill and rotavator will prove useful to the WUA farmers. Subsidy is provided to farmers. Subsidy schemes for purchase of farm equipment must be made known to farmers of WUAs. Subsidies should be provided to farmers of WUA for the purchase of farm machinery.

**(15) Postharvest Handling, Processing of Produce and Storage**

Postharvest Management: To minimize the loss of horticultural produce, post management is important. Post harvest technologies should be promoted to improve the quality of horticultural produce. Activities like waxing, grading, packaging, protection and conservation of produce are useful. Post harvest handling will improve the quality of the produce to and will fetch better market prices.

**(16) Postharvest Product Handling (through KVK)**

By centralized demonstration at KVK centers pest harvest technologies should be promoted to improve the quality of agricultural produce including produce protection, conservation, packaging and distribution to meet the food and nutritional requirements of modern day consumers. Post-harvest product handling will improve the quality of the product and farmers will fetch better market prices.

**(17) Farmer-level Processing of Produce (through KVK)**

Demonstrations of devices and small processing equipment and practical training at KVK centers in preservation of fruits and vegetables.

Small scale processing of products such as Aonla Murabba, Aonla Candy, Squashes, Jam, Jelly, Chatnis, Sharbats etc. as well as of milk products, packaging and marketing of product. These will considerably add to the income of the farmer families.

**(18) Cold Storage**

Farmers of WUAs are producing substantial amounts of perishable fruits and vegetables, construction of cold storage might be essential investment to fetch better market prices and to reduce losses of produce due to inadequate storage. Transportation of cooled products needs to be cooled too i.e.

Cold storage trucks may be a viable asset to production groups of participating WUAs. Cold storage and transport could be used to supply super markets in large cities with quality products based on long term contracts between WUAs and super markets such as Big Bazaar and Hyper city.

DoH is supporting such investment with technical advice and financial subsidies.

**(19) Low Cost Onion Storage Structure**

Farmers have to dispose of their onion on cheaper rate after harvest. Onion cannot be stored for longer period, therefore, to store the onion bulb for longer period to fetch better price store in

onion storage structure. Low cost onion storage structure will be useful to store the bulbs of onion. DoH is having a model of low cost onion storage structure. DoH is providing 50% subsidy for the construction of low cost onion storage. Subsidies can be provided to WUA farmers for construction of low cost onion storage.

**(20) Grain Stores**

Most of the farmers have to sell their grain and spices immediately after harvesting and threshing at lowest market prices as there is no grain store within their village.

Every year farmers have heavy loss of grain due to damage by rodents and by untimely early rains, if the grain left in the field under the open sky.

Marketing board is providing 25% subsidy for the construction of grain stores of 50 to 100 ton capacity.

It is proposed that for promotional purposes to add the remaining 75% cost out of project funds for a limited number of grain stores.

**(21) Training**

Every year two one day training to farmers and women farmers may be provided by DoA and KVK. Out of two one day training, one training may be for women farmers. Topics of training are summarized in Table 1:

**Table 1 : Topics of Training**

| No. | Topics of Training |
|---|---|
| 1 | Awareness of departmental programme. |
| 2 | How to improve productivity. |
| 3 | Village level cropping pattern (Area, Production & Productivity) |
| 4 | Improved varieties of different crops. |
| 5 | Use of fertilizers and soil test. |
| 6 | Irrigation at critical stages of crops. |
| 7 | Increase in sprinkler irrigation. |
| 8 | Drip irrigation system. |
| 9 | Organic farming. |
| 10 | INM |
| 11 | IPM |
| 12 | Summer Ploughing. |
| 13 | Use of Pheromone trap and light trap. |
| 14 | Management of different insect pests. |
| 15 | Weed management. |
| 16 | Crop and varietal diversification. |

**(22) Training at KVK Centres**

43 KVK'S are in operation in Rajasthan. KVK's are established in each district of the state. KVK's belongs to state agricultural universities, ICAR and N.G.O's. Under the motto of "lab to the land". KVK's are promoting modern agriculture production methods, appropriate agriculture machinery and utilization of alternate energy sources such as biogas and solar energy as well as food preservation, cottage level processing of fruits, vegetables and dairy products.

Farmers can be trained by KVK's in well established technical training on vermi compost, improved rearing practices of goats, cattle, pig, poultry, production of planting material of vegetables and fruits, bee keeping and seed production.

**(23) Major Areas of KVK Training**

- Crop diversification in irrigated areas.
- Introduction of horticulture based cropping system.
- Farming system ie. raising of crops and dairy for higher income.
- Rejuvenation of old orchards.
- Introduction of more remunerative new crops and water wise crops into the cropping system.
- Income generation of rural poor women.
- Enforcement of proper IRM strategies.
- Yield enhancement of vegetables, pulses, oil seed crops and seed spices through implementation of proper INM and IPM.
- Water management and soil conservation.
- Farm mechanization.
- Post harvest product handling and marketing.
- Solar power in agriculture.

**(24) Exposure Visit**

Exposure visit of officer/experts of DoA may be condected. Exposure visit of farmers of WUA should be conducted. Exposure visit of farmers will be useful as farmers can observe various progressive activities of agriculture in the field/centers.

**(25) Workshops**

One two day state level workshop for officials of DoA should be conducted at State Institute of Agriculture Management (SIAM) Durgapura every year. The Dy. Director Agriculture, Agriculture Research Officer (ARO), Agriculture Officer (AO) can participate in 2 day state level workshop.

Seven two day district level workshops can be conducted at SIAM, Durgapura & SIAM, Kota, Asstt. Agriculture Officer (AAO) and Agriculture Supervisors of Projects District can participate.

**(26) Solar (DoH)**

Rajasthan State received 6-7 kv/$m^2$/day of solar insolation which one of the best in the world. There are around 325 sunny days in the state which makes it most suitable for solar project. The solar venture provides opportunities for production and uninterrupted supply and access of energy during day time in the remote areas which are otherwise unfeasible for distribution. Currently subsidy for 3 HP and 5 HP solar pumps is provided by DoH.

**(27) Krishi Vigyan Kendra (KVK)**

KVK are trying to help farmers through transfer technology, skill development, adoption of holistic approach to agriculture, farm women empowerment and promotion of innovative farming approaches. The mandate of KVK is to conduct "on farm testing" for identifying technologies in term of location specific sustainable land use systems. KVKs are organizing short term and long term vocational training in agriculture and allied vocations for farmers and rural youths with emphasis on "learning by doing" for higher production on farms and generating self employment.

**(28) Thrust Areas**

- Increasing crop production through agriculture techniques.
- Sustainable crop production through INM.
- IPM (Integrated Pest Management)
- Water harvesting and water management techniques.
- Increasing productivity of dairy animals through breeding, feeling and health management.
- Diversification through Horticultural and medicinal crops.
- Value addition and post harvest technology of agro and milk products.
- Woman empowerment through SHG groups and income generating activities.
- Popularization of organic farming for sustainable agriculture.
- Popularizing of back yard poultry farming and goatry among weaker section.

Farmer of WUAs will be imparted training at KVKs.

**(29) Agricultural Marketing**

Agricultural marketing in Rajasthan has made a notable progress with paradigm shift in approach to keep pace with the change, in agriculture production and growing marketable surplus. A wide network of dynamic and vibrant marketing system for agriculture produce with well developed 134 main markets and 308 market yards exist in the state.

The state has promulgated a policy for the promotion of agro processing industries and agribusiness, which seeks to address the entire value chain in agro processing and marketing entrepreneurs are entitled to the following category incentives:

A. Incentives admissible under the Rajasthan invest promotion scheme 2010.

B. Additional incentives / concessions under this policy for:

   (a) New employment creation.

(b) Electricity duty.

(c) Stamp duty.

(d) Land related issues.

(e) Market development and diversification.

(f) Quality and Standards.

(g) Direct purchase and market fee.

(h) New project development.

# *Attachment 2.1.6*
# *Subsidies by National and State Governments*

# Attachment 2.1.6 Subsidies by National and State Governments

## A. Several Kinds of Subsidies

### (1) Pipelines on Farm

Use of pipelines plays an important role for saving of irrigation water by 15-20 percent. Irrigation water is lost in irrigation channels due to percolation. This loss is higher in light loamy soils as the infiltration rate is 25 to 70 MM/hr and in case of loamy soils the infiltration rate is 15 to 20 MM/hr. In clay and clay loam the percolation loss is less as compared to light soils as these soils are having low infiltration rate i.e. 4 to 10 MM/hr. Farmers are provided 50 percent subsidy of the cost or maximum 15,000 INR whichever is less. DoA and DoH are providing subsidy on pipelines.

### (2) Solar PV System

Rajasthan state receives 6-7 KW/M2/day of solar insolation which is one of the best in the world. There are around 325 sunny days in the state, which make it most suitable for solar projects. The solar venture provides opportunities for productions an uninterrupted supply and access of energy during day time in the remote areas.

Government of India launched Jawaharlal Nehru National Solar Mission in January 2010. The objective is to achieve large-scale deployment of Solar Energy Systems and also to assist domestic production of critical raw materials, components and products to achieve grid parity by 2022.

As part of this mission the Government has initiated a subsidy scheme to help individuals and organizations procure these Solar Energy Systems at reduced capital costs. The scheme is being implemented by IREDA (Indian Renewable Energy Development Agency Ltd.) through NABARD (National Bank for Agriculture and Rural Development). The scheme that was last modified on 15th March 2012 provides 40% subsidy on capital costs of Solar PV Systems for units located in both urban and rural areas in India.

### (3) Solar Pump

The programme of solar pumps started in 2008-09 under RKVY[1] (Rashtriya Krishi Vikas Yojana) on 14 Government farms. The success of the experiment led to inception of pilot project of 34 solar pumps at farmers' field during 2010-11. Large-scale implementation funded by JNNSM (Jawahar Lal Nehru National Solar Mission) began in 2011-12 in 14 districts and achieved 1675 pumps. Target and Achievement of solar pump installation programme is summarized in the following table.

**Table 1 Target and Achievement of Solar Pump**

| Year | Project | No. Of Dist. Covered | Target | Achievement | Project cost (Rs. Cr.) | MWp | Pump capacity (wp) | Subsidy rate (%) | Funding source |
|---|---|---|---|---|---|---|---|---|---|
| 2008-09 | Government Farms | 7 | 14 | 14 | 0.75 | 0.025 | 1800 | 100% | RKVY |
| 2010-11 | Pilot Project | 6 | 50 | 34 | 1.83 | 0.097 | 2200/ 3000 | 86% | JNNSM, RKVY |
| 2011-12 | First major jump | 14 | 500 | 1,649 | 95.86 | 4.967 | 2200/ 3000 | 86% | JNNSM, RKVY |
| 2012-13 (in progress) | Second major jump | 33 | 2,200 | 4,280 | 258.29 | 13.340 | 2200/ 3000 | 86% | JNNSM, RKVY/ State |
| 2013-14 | Third major | 33 | 10,000 | 9,626 | 584.69 | 30.000 | 2200/ | 86% | JNNSM+ |

[1] Rashtriya Krishi Vikas Yojana (राष्ट्रीय कृषि विकास योजना) is a special Additional Central Assistance Scheme which was launched in August 2007 to orient agricultural development strategies, to reaffirm its commitment to achieve 4 per cent annual growth in the agricultural sector during the 11th plan. The scheme was launched to incentivize the States to provide additional resources in their State Plans over and above their baseline expenditure to bridge critical gaps.

| Year | Project | No. Of Dist. Covered | Target | Achievement | Project cost (Rs. Cr.) | MWp | Pump capacity (wp) | Subsidy rate (%) | Funding source |
|---|---|---|---|---|---|---|---|---|---|
| (Projected) | jump | | | | | | 3000 | | RKVY/ State |
| 2014-15 (Projected) | | 33 | 5,200 | 1,500 under | 166.31 | 11.100 | 2200/ 3000 | 70% | JNNSM+ State Resources |

*Source: FAO, Dinesh Kumar, 2016,"Solar Water Pumpset Programme Rajasthan"*

### (4) Pressurized Micro Irrigation Method

Rajasthan has no other recourse, but to take the path of more crop and income per drop of water. Pressurized irrigation methods are the only option.

**(a)** Sprinkler System

Sprinkler system of irrigation is more suitable for light soils having higher infiltration rate. The sprinkler systems of two holes work successfully with pressure 2.0 to 2.5 Kg. /Sq. Cm. This system is suitable for low row spacing crops like wheat, barley, gram and mustard. It save water and labour and an overall 36-40 percent decrease in the expenditure of irrigation. Farmers are provided 50 percent subsidy of the cost or 10,000 INR per hectare, whichever is lower. DoA and DoH are providing subsidy on sprinkler system.

**(b)** Drip Irrigation

Drip irrigation is recent and effective method of irrigation for fruits plants like guava, papaya, grapes, dat palm, citrus, vegetable crops like: Tomato, Brinjal, Battle Guard, Chillies, Cole crops and wide spacing crop sugar cane. In this method saving of water is 50 to 80 percent. Earlier DoA was providing 90 percent subsidy but currently it has been reduced to 70 percent.

### (5) Water Storage (doggi and farm pond) and Water hose

Rajasthan has no other recourse but to the path of efficient use of water. Special attention should be given on harnessing the rain water. Emphasis should be given on promotion of water harvesting structures. Construction of water reservoirs or "diggies" in canal command areas, should be supported with installation of sprinkler and drip system. For efficient use of canal water construction of water hose for efficient use of water for irrigation and construction of farm pond for rain water harvesting and storage should be promoted.

**(a)** Construction of Diggi (4 *Lakh* capacities)

For district of Sri Ganganagar, Hanumangarh, Baran, Bundi and Kota. A subsidy of 50% cost or maximum 2.0 *Lakh* whichever is less for construction of diggi.

**(b)** Farm Pond

Construction of farm pond scheme is for all the districts. A farm pond of 20x20x3 meter (1200 $m^3$) size is to be constructed. For construction of farm pond, 50% of cost or 52,500 INR whichever is less is provided as subsidy.

**(c)** Water Hose

Areas having irrigation from wells/tube wells, subsidy is provided by DoA for construction of water hose of 30x20x06 ft. (3600 cubic ft. size) or not less than 1 *Lakh* Liter capacity. Subsidy of 50% of cost of construction or 75,000 INR whichever is less.

**Table 2 Subsidies for Development of Water Storage**

| | | | |
|---|---|---|---|
| A | Construction of Water Storage Tank Plastic Lining or RCC lining (In group of farmers) | 12.0 *Lakh* INR | On 50M x 50M x 3M Size. Water Storage tank 3.75 *Lakh* INR from National Horticulture mission and 3.75 *Lakh* INR from National Agriculture Development plan. |

| | | | |
|---|---|---|---|
| B | Development water storage tank (Individual farmer) | 2.80 *Lakh* INR plastic lining RCC Lining 2.80 *Lakh* INR per Unit | 50% cost or maximum 1.40 *Lakh* INR / Unit (0.60 *Lakh* INR National Horticulture Development Mission and 0.80 *Lakh* INR National Agriculture Development) |

*Source: Department of Horticulture*

### (6) Protected Cultivation

Under adverse climatically condition to provide favourable environment for the growth of horticultural crops, promotion of improved techniques like green house, shade net, plastic tunnel and plastic muleh are useful and subsidies are provided.

**Table 3 Subsidies for Protected Cultivation**

| Name of Item | Unit Cost | Subsidy Available |
|---|---|---|
| Green House (Tubular Structure) | 935 INR / $m^2$ | 50% of cost or maximum 467.50 INR / m2. One farmer can avail subsidy for 4,000 sq. meter in addition to this small and marginal farmers avail, additional subsidy of 25% from State Govt. |
| Shade net house (Tubular Structure) | 600 INR / $m^2$ | 50% of cost or maximum 300 INR / m2. One farmer can avail subsidy for 4,000 sq. meter area |
| Plastic mulch | 20,000 INR / ha | 50% of cost or maximum 10,000 INR / ha. One farmer can avail subsidy for 2 hectare |
| Plastic tunnel | 30 INR / $m^2$ | 50% of cost or maximum 15 INR / m2. One farmer can avail subsidy for 4,000 sq. meter. |
| Anti Bird net | 20 INR / $m^2$ | 50% of cost or maximum 10 INR / m2. One farmer can avail subsidy for 5,000 sq. meter. |

*Source: Department of Horticulture*

### (7) Under National Food Security Mission (wheat) of DoA are Providing Subsidy on

i) Field demonstration on wheat.
ii) Distribution of seed of improved variety of wheat: 50% cost of seed or 1,000 INR whichever is less.
iii) For promotion of use of micronutrients: 50% of cost or 500 INR per farmer whichever is less.
iv) For use of plant protection chemicals or Bio agent: 50% of cost or 500 INR per farmer whichever is less.
v) For use of chemical weedicides: 50% of cost or 500 INR per farmer whichever is less.
vi) Subsidy on farm machinery:
   (a) Seed drill & seed cum fertilizer drill.
   (b) Disc plough and disc harrow.
   (c) Multi crop thresher.
   (d) Tractor mounted reaps.
   (e) Seed storage bin – 50% of cost or 1,000 INR whichever is less.
vii) Subsidy on pump set: for purchase of pump of 10 HP or 7.5 KW capacities, 50% of cost or 10,000 INR whichever is less. Subsidy is also provided on pipeline, sprinkler system.

### (8) Subsidies under National Food Security Mission (Pulse, oilseeds and maize)

Subsidies are also provided under National Food Security Mission (Pulse, oilseeds and maize).

In case of pulses, oilseeds and maize, the farmers would get 2,000 INR per quintal of 50 percent of cost, whichever is less, on seeds including hybrid ones. The earlier maximum limit was 1,200 INR per quintal.

### (9) Training on Integrate Pest Management (IPM) and IPM Materials

Subsidy will be provided for IPM training for 30 persons. Maximum subsidy INR 26,700 and the subsidies are also provided for IPM materials (light trap, seed drum, power driven sprayers and tractor mounted sprayers).

## (10) Other Subsidies through Department of Horticulture

**Table 4 Subsidies by Department of Horticulture through National Horticulture Development Mission**

| No. | Name of Item | Unite Cost | Subsidy Available |
|---|---|---|---|
| 1 | Model Nursery Development (2 to 4 Hectare) | 6.25 INR / Unit | 50% of unit cost or maximum 12.50 *Lakh* INR for 4 Hectare |
| 2 | Small Nursery (1 Hectare) | 6.50 *Lakh* INR / Ha Unit | 50% of unit cost or maximum 3.12 *Lakh* INR |
| 3 | Structure for seed development | As per project | 50% cost of the project maximum 100 *Lakh*. INR Project is being approved by Govt. of India. |
| 4 | Intensive development of Orchard | 80,000 INR / Ha | 50% of cost or maximum 40,000 INR / Ha. In three years 60:20:20 ratio. One farmer can avail subsidy upto 4 hectares. |
| 5 | Normal development of Normal Orchard | Maximum 40,000 INR | 75% of cost or maximum 30,000 INR / per hectare (In three years 60:20:20 ratio). One farmer maximum area 4 ha. |
| 6 | Rejuvenation of old orchards | 30,000 INR / ha | 50% of cost or maximum amount 15,000 INR / ha one farmer maximum area 2 hectare |
| 7 | Formation of Spice Orchards | 11,000 INR / ha | 50% of cost or maximum amount 5,500 INR /- |
| 8 | Construction of vermi compost unit | 1.00 *Lakh* INR | 50% of cost or maximum 50,000 INR |
| 9 | (a) Beekeeping Colony (8 Frames)<br>(b) Beekeeping Box | 2,000.00 INR<br>2,000.00 INR | (a) 40% cost or maximum 800 INR/- per colony (Maximum 50 colony to a farmer)<br>(b) (a) 40% cost or maximum 800 INR/- per box (Maximum 50 boxes to a farmer) |

*Source: Department of Horticulture*

## (11) Postharvest Management

To minimize the loss of horticultural produce, post management is important. Postharvest technologies should be promoted to improve the quality of horticultural produce. Activities like: Waxing, Grading, Packaging, Protection and Conservation of produce are useful. Postharvest handling will improve the quality of the product and will fetch better market prices.

**Table 5 Provision of Study for Development Programme**

| No. | Development Programme | Estimated Cost | Provision of subsidy for help |
|---|---|---|---|
| 1 | (a) Pack house | 4 *Lakh* / unit | 50% of cost or maximum 2.0 *Lakh* INR / unit |
| | (b) Refrigerated Van | 26.0 *Lakh* (4 to 9 MT) | 35% of cost. |
| | (c) Ripening chamber 300 MT | 1.0 L / MT | 35% of cost. |
| 2 | Store for Onion bulbs | 1.75 *Lakh* | 50% of cost. |
| 3 | National Bamboo Mission | 10,500/- | 35% of cost for planting bamboo seedlings for three years. 1st year 5,250 INR, IInd & IIIrd year 2,625 INR and 2,625 INR |

*Source: Department of Horticulture*

# *Attachment 2.1.7*
# *Procedure to Get Subsidy on Solar PV Systems through NABARD in India*

# Attachment 2.1.7 Procedure to Get Subsidy on Solar PV Systems through NABARD in India

The steps mentioned below outlines the process of purchasing a Solar PV System and also to obtain subsidy/loan through NABARD.

1. As a first step, it is important to choose the right manufacturer/supplier from whom you purchase the Solar PV system. The manufacturer/supplier should be a MNRE (Ministry of New and Renewable Energy) approved manufacturer/supplier. To get a list of approved suppliers in your area, you can check the link: http://www.mnre.gov.in/information/manufacturesindustriesarchitectsconsulting-organisation/
2. Only the models approved by MNRE are eligible to be covered under the scheme. The list below gives models approved by MNRE:

**Technical and Financial parameters of pre-approved Models to be financed**

| Model | Photovoltaic modules/ panels (Wp) | Battery capacity | Maximum recommended load and duty cycle | Benchmark Cost (₹.) | Max. capital subsidy eligible * (₹.) |
|---|---|---|---|---|---|
| I | 10 | 12 V, 7 AH (SMF) | 5-7 watt load for 3 to 4 hrs (20 watt hrs/day) | 2700 | 1080 |
| II | 18-20 | 12 V, 20 AH (Tubular L.M./Gel VRLA) | 10 watt load for 4 hrs (40 watt hrs/day) | 4860-5400 | 2160 |
| III | 37-40 | 12 V, 40 AH (Tubular L.M./Gel VRLA) | 20 watt load for 4 hrs (80 watt hrs/day) | 9990-10800 | 4320 |
| IV | 50 | 12 V, 60 AH (Tubular L.M./Gel VRLA) | 30 watt load for 4 hrs (120 watt hrs/day) | 13500 | 5400 |
| V | 70-80 | 12 V, 80 AH (Tubular L.M./Gel VRLA) | 45 watt load for 4 hrs (180 watt hrs/day) | 18900-21600 | 8640 |
| VI | 100 | 12 V, 120 AH (Tubular L.M./Gel VRLA) | 60 watt load for 4 hrs (240 watt hrs/day) | 27000 | 10800 |
| VII | 125 | 12 V, 150 AH (Tubular L.M./Gel VRLA) | 75 watt load for 4 hrs (300 watt hrs/day) | 33750 | 13500 |
| VIII | 150-160 | 24 V,75/80 AH (Tubular L.M./Gel VRLA) | 90 watt load for 4 hrs (360 watt hrs/day) | 40500-43200 | 17280 |
| IX | 200-210 | 24 V, 100/120 AH (Tubular L.M./Gel VRLA) | 120 watt load for 4 hrs (480 watt hrs/day) | 54000-56700 | 22680 |

* @ ₹ 108 per watt of module capacity

*(Source: NABARD)*

3. The benchmark cost of solar PV system as per a NABARD document (link) is Rs 270 per Wp. But the unit costs are revised from time to time and your manufacturer/supplier should be able to guide you properly on the same.
4. In case the cost of the unit is less than the benchmark cost then the full 40% subsidy can be claimed. But if unit cost is more than the benchmark cost then the capital subsidy will be limited to the maximum capital subsidy ceiling as indicated in the table above.
5. To avail the subsidy, you need to have an account with a scheduled commercial bank or a regional rural bank. Most public nationalized banks can be approached for this.
6. 40% of the cost is subsidized and the rest 60% of the cost is eligible for a soft loan. However the margin to be paid by the beneficiary (out of the 60%) is decided as per RBI norms. The repayment period of the loan is 5 years. The interest rates are also as per RBI norms.
7. To obtain the loan one has to submit the quotation and the documents available from the vendor. Vendor should provide the MNRE approval form, TIN number, project proposal, etc which needs to be submitted to the bank.
8. After processing the loan and verifying all the documents, the banks provide loan and the documents are sent to NABARD for release of subsidy. The EMIs start as soon as the loan is processed; however release of subsidy through NABARD takes some time. As per MNRE, the interest on the loan should not be for the subsidy part.
9. The banks have the right to recall the subsidy in case they observe that the subsidy is misused.

# *Attachment 2.4.1*
# *Organizational Composition of WUA*

## Attachment 2.4.1 Organizational Composition of WUA

1. Outline of WUA composition

According to PIM Act, 2000, water users' association (WUA) is formed at the primary level, notified by the Project Authority as a water users' area, consisting of all the water users who are landowners in such water users' area as members.

The Act also mentions that the command area under the minor and lift irrigation systems, the entire command area may, as far as possible, form a single water users' area. All this members constitute the General body of the WUA and have right to vote.

Then there is a Managing Committee (MC) for every WUA. It consists of President and one Member from each of the territorial constituencies of a water users' area. The president and the MC members are elected by the general body by the method of secret ballot.

Besides MC, PIM Rules, 2002, suggested forming sub-committees as follows;

i) Administration, Finance and Resources sub-committee
   - Not more than three members having minimum education qualification of the secondary.
   - Nominated by president of WUA/MC

ii) Works sub-committee
   - Eight nominated members: six members are nominated by MC (two members representing head reach, two from middle reach and two from tail reach), the rest two members are nominated by the competent authority on request of MC out of which one shall be from available technical/supervisory staff of the department and other shall be either a village level agricultural assistant or any other local government employee nominated by District collector on the request of the competent authority.

iii) Water Management and Agriculture sub-committee
   - Constituted by president on the recommendation of MC
   - Consisting of six members: two members representing head reach, two from middle reach and two from tail reach
   - Two members from concerned department employee in charge of the reach or Agriculture Supervisor as nominee of the competent authority for technical guidance

iv) Monitoring, Evaluation and Training sub-committee
   - Constituted by president in consultation with the competent authority
   - Consisting of three members: two are nominated by president and one by the competent authority

v) *Chak Samiti* (Outlet committee)
   - Constituted *chak*-wise by MC
   - Consisting of three farmer members of the concerned *chak* nominated by the president

2. Estimated WUA composition in the Project

Since the Project targets minor and medium irrigation schemes, a single water users' area is estimated 1,000 ha in average and every water users' area is divided into territorial constituencies (TC) on the basis of following norms:

i) Area up to 500 ha : 4 TCs
ii) Area from 501 ha to 1000 ha : 6 TCs.
iii) Area from 1001 ha to 1500 ha : 8 TCs
iv) Area from 1501 ha to 2000 ha : 10 TCs

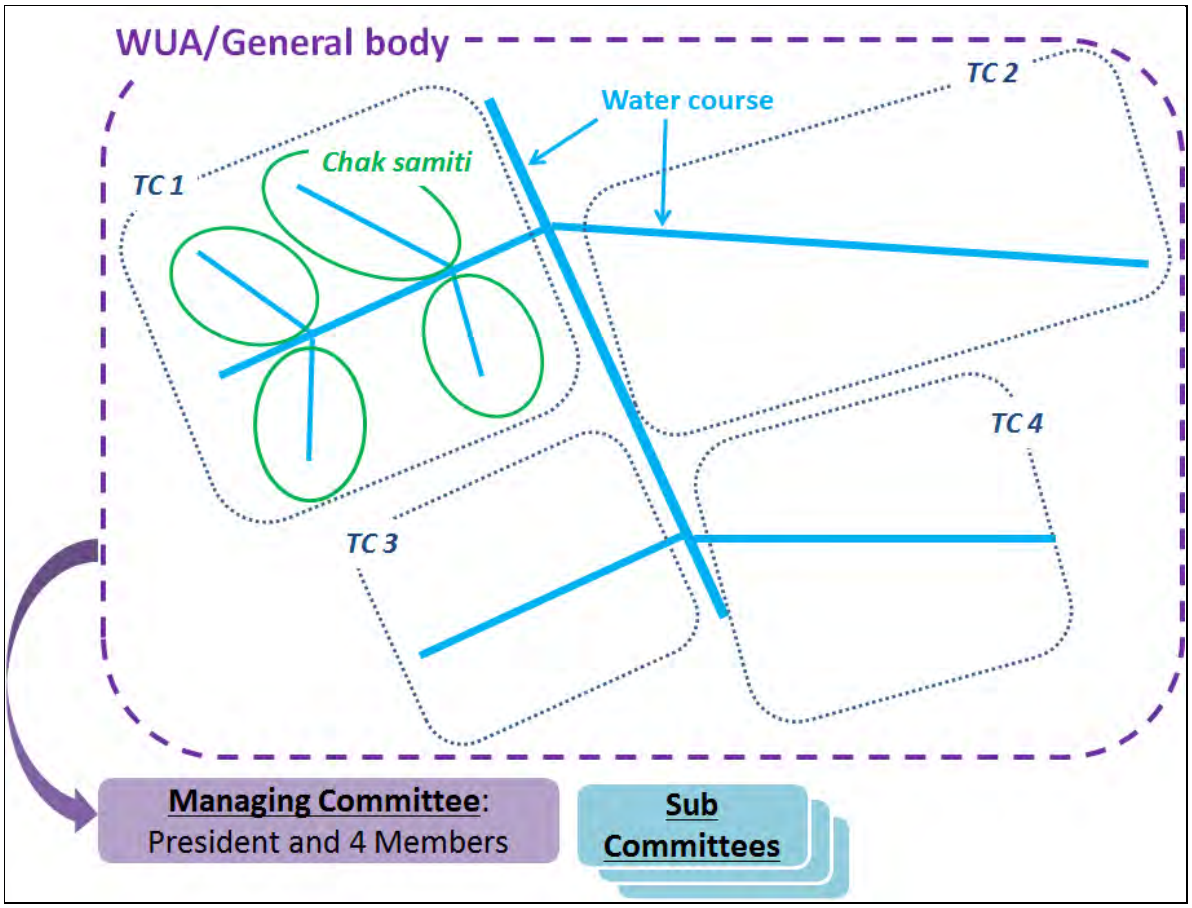
Example for sub-project of 400 ha and 6,500 ha is shown in the following table.

**Table 1 Sample Calculation on Number of WUA and TC**

| Sub-project | CCA (ha) | Number of WUA (1 WUA per 1,000ha) | Area per WUA in average (ha) (CCA/No. of WUA) | Number of TC per WUA | Total number of TC in sub-project |
|---|---|---|---|---|---|
| A | 400 | 1 | 400 | 4 | 4 |
| B | 6,500 | 7 | 928.57 | 6 | 42 |

*Source: JICA survey team*

Organizational composition of WUA is shown in the following figure.




*Source: JICA survey team*

**Figure 1 Sample Organizational Composition of WUA with 450 ha (4 TCs)**

*Attachment 2.5.1*
*KVK (Krishi Vigyan Kendras)*

## Attachment 2.5.1 KVK (Krishi Vigyan Kendras)

### (a) Historical Background of Krishi Vigyan Kendras (Farm Science Centre)

Krishi Vigyan Kendra (KVK), a plan scheme designed and nurtured by Indian Council of Agricultural Research (ICAR) for the past four decades, will play a vital role as it has the following unique features:

- Creation of valuable resources in terms of technical manpower and assets,
- Confirmation of technologies to suit local specificity,
- Showcasing the frontier technologies,
- Capacity building among stakeholders,
- Front runner in technological application, information and inputs, and
- Participatory approaches in planning, implementing, executing and evaluation.

All the KVKs are working towards reducing the time lag between generation of technology at the research institution and its application to the location specific farmer fields for increasing production, productivity, and net farm income on a sustained basis with the following mandate:

### (b) Mandate

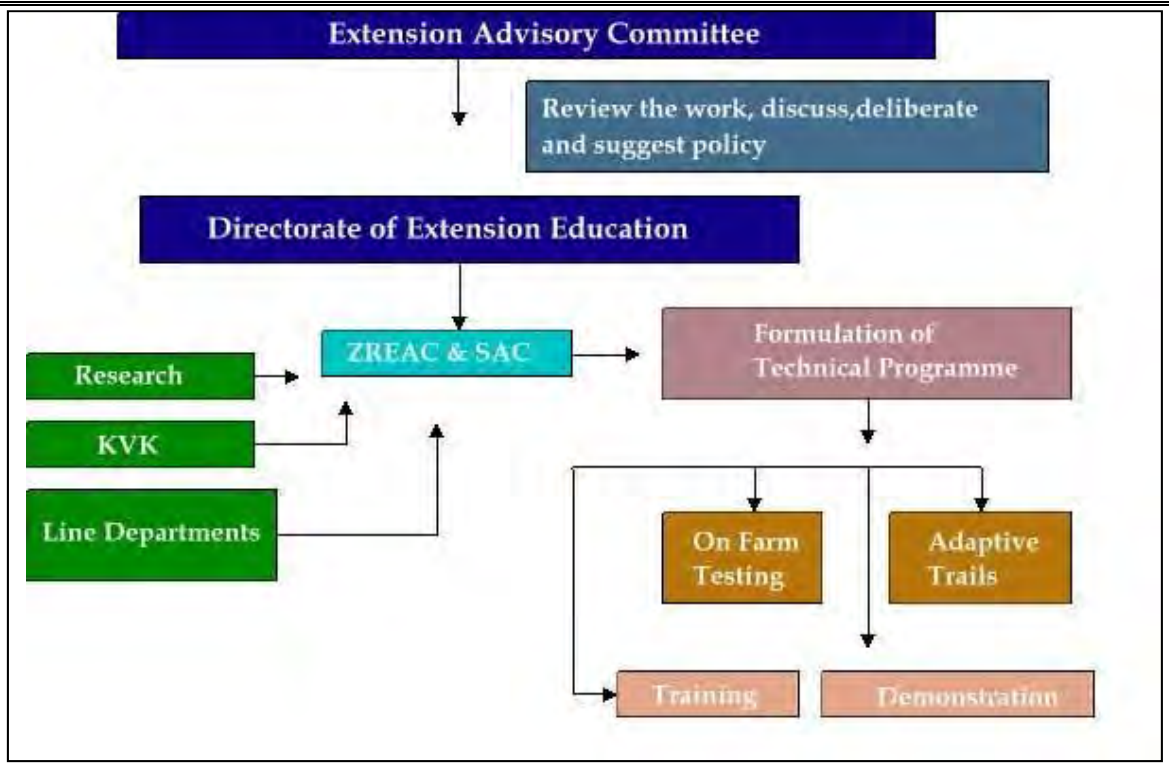
Mandate of KVK is to apply technology and products through assessment, refinement, and demonstration for adoption. To achieve the mandate effectively, the following activities are envisaged for each KVK:

- On-farm testing to identify the location specificity of agricultural technologies under various farming systems.
- Frontline demonstrations to establish its production potentials on the farmers' fields.
- Training of farmers and extension personnel to update their knowledge and skills in modern agricultural technologies.
- Work as resource and knowledge centre of agricultural technologies for supporting initiatives of public, private and voluntary sector for improving the agricultural economy of the district.
- Produce and make available technological products like seed, planting material, bio agents, young ones of livestock etc to the farmers
- Organize extension activities to create awareness about improved agricultural technologies to facilitate fast diffusion and adoption of technologies in agriculture and allied sectors

### (c) KVKs in Rajasthan

There are 42 KVKs in Rajasthan State. Out of 42 KVKs, 33 KVKs are under 5 State Agriculture Universities (SAU) and 3 KVKs, 4 KVKs and 2 KVKs are under Indian Council of Agricultural Research (ICAR), under NGOs control, and under Other Education Institutes (OEI) respectively. A list of KVKs in Rajasthan should be referred to Attachment 2.5.1. 5 SAU include Swami Keshwanand Rajasthan Agricultural University (Bikaner), Maharana Pratap University of Agriculture and Technology (Udaipur), Shri Karan Narendra Agriculture University (Jobner), Kota Agriculture University (Kota) and Jodhpur Agriculture University (Jodhpur).

Overall structure and its position for KVKs under SAU in Kota as a sample are illustrated in the figure below.




*Source: JICA Survey Team*

**Figure KVK's Position in the Structure of State Agriculture University**

KVKs under Agriculture University are financially sponsored by the national government, but are technically supported by the University. KVKs can get information from Zonal Research and Extension Committee (ZREAC) and Scientific Advisory Committee (SAC). Usually the scientists of KVKs are dispatched by the university. The university has Directorate of Extension Education for training to farmers and extension staffs of lined departments.

For example, Directorate of Extension Education, Kota organizes short duration trainings for practicing farmers and farm women on crop production, horticulture, plant protection, animal production, home science, and other related disciplines. The trainings are sponsored by line departments of agriculture, horticulture, soil water conservation, and NGOs. The university sells the following products of Directorate of Extension Education:

- Seeds of field, vegetable and horticultural crops;
- Nursery plants of vegetable, fruits and ornamental plants;
- Bio-fertilizers;
- IPM- organic and bio-pesticides;
- Small farm implements;
- Processed agro- products and by-products; and
- Vermiculture and vermicompost;

They also provide services:

- Soil and water testing,
- On farm consultancy for farmers,
- Farm literature – leaflets, pamphlets, journals, farm magazine, and booklets,
- Audio and video CD's of crops and other agri-enterprises, and
- Exhibition and live specimen.

### 1) KVKs under Agriculture University, Kota

There are 6 KVKs under Kota Agriculture University, in Kota. They cover Agro-climatic Zone V and IIIB. There are usually 6 scientists in each KVK such as in charge of horticulture (vegetable and fruits), plant protection, agronomy, home science, animal husbandry, and extension.

**a) Main Activities**

Their main activities are:

- Experimental cultivation in trial farm (Evaluation of techniques and improvement);
- Training to farmers, woman farmers, rural youth and extension staffs of lined department;
- Practical vocational training for agriculture and concerned industries;
- Demonstration of new variety and effective varieties in experimental farm; and
- Extension activities (Farm visit, visit to advanced farmers, distribution of hand-out or other materials.

**b) Other Activities**

In addition to the above, KVKs covers the following activities:

- Cost and profit calculation for *Kharif* and *Rabi* crops;
- Awareness campaign for IPM (Integrated Pest Management), IDM (Integrated Disease Management), INM(Integrated Nutrition Management) and water management;
- Extension of organic farming for effective resource utilization and for soil health;
- Extension of high-tech production techniques for protected cultivation including micro irrigation;
- Empowerment of rural women in social status, health and economy; and
- Public relations for improvement of thought and acts for leadership and institutional development of farmers.

**c) Trainings**

The KVK provides two types of trainings: (1) short duration trainings, e.g. on-campus trainings of 2-3 days and off-campus trainings of one day; and (2) long duration trainings of 5-50 days depending on the budget and sponsorship. The budget is provided by ICAR and other sponsoring agencies, e.g. DoA, RMoL, NHM, Zila Parisad, NGO and so on.

On an average a KVK conducts 50 to 60 need-based training programs in a year for farmers, farmwomen, and rural youth. More emphasis has been given on a long duration self-employment oriented training for school dropouts and unemployed rural youth. Many participants on completion of the training have been successfully self-employed by way of establishing their own unit for poultry, animal, nursery, fruits & vegetable processing, jewellery making, beauty parlour, pump repairing, and beekeeping. Efforts have also been concentrated to empower the women component technically, as they play a very vital role in agricultural operations.

As these information showed, KVKs can provide the most localized information and agricultural techniques to farmers, woman farmers, and rural youth. Therefore, both training of trainers (ToT) of extension staffs from DoA, DoH, and NGO staffs; and training for farmers will be conducted effectively in KVKs.

# *Attachment 2.5.2*
# *Sample of Questionnaire for Household Survey*

# Attachment 2.5.2 Questionnaire of Household Survey

| S.No | Village Name | Farmer's Name | Age | Male/Female |
|---|---|---|---|---|
| | | | | |

| Presence of Water User's Association | Membership | Membership Fee |
|---|---|---|
| | | |

| Land ownership (area) | Irrigated (ha) | Non irrigated(ha) | Women owned (type, ha) |
|---|---|---|---|
| | | | |

## I. Agro-climatic condition

| | |
|---|---|
| **1.** | **Soil type (in the region/District)** |
| a. | Predominant soil type: Sandy, Sandy loam, Clay, Clay loam, Silty clay loam, Gravel, Rock, etc. |
| b. | pH (if available): <3 3.5 4 4.5 5 5.5 6 6.5 7 7.5 8 8.5 >9 |
| **2.** | **Water sources** |
| a. | Types (including rain-fed): Lake, Pond, River, Stream, Canal, Irrigation channel, Well |
| b. | Availability (Access/Frequency/Cost): Available Not available / 1,2,3, times / Rs. |
| **3.** | **Present and Proposed/Expected Irrigated Land area** |
| a. | Current irrigated area (ha): ha |
| b. | Proposed/expected irrigated area: ha |
| **4.** | **Mode of water allocation/Distribution** |
| a. | Mode (e.g. Continuous, Rotation, Partial distribution): |
| b. | Frequency (when rotation): times/year |
| c. | Amount (mm) allocated/distributed: mm/ha/year |
| **5.** | **Planned irrigation intervals** |
| a. | Periods (Frequency): times/kharif season, times/rabi season |
| b. | Amount (mm per unit area) per time: Kharif season(1st irrigation mm/ha, 2nd irrigation mm/ha, 3rd irrigation mm/ha, 4th irrigation mm/ha, 5th irrigation mm/ha), Rabi (1st irrigation mm/ha, 2nd irrigation mm/ha, 3rd irrigation mm/ha, 4th irrigation mm/ha, 5th irrigation mm/ha) |
| c. | Amount total (mm per unit area): mm/ha/year |
| **6.** | **General terrain of the farm** |
| a. | Types and Proportions: Flat area %, Moderate slope %, Steep slope %, Swamp %, ( ) % |

## II. Technical aspect (Cultivation techniques and costs)

| | |
|---|---|
| **1.** | **Cropping pattern records (Cropping periods of each season from land preparation to harvesting)**<br>***Please fill in the separated recording sheet A for this section** |
| a. | Crops: Kharif ( ), Rabi ( ) |
| b. | Rain-fed/Irrigated: Kharif (Rain-fed %, Irrigated %), Rabi (Rain-fed %, Irrigated %) |

| | |
|---|---|
| c. | Area: Kharif ( ha, ha, ha, ha, ha), Rabi ( ha, ha, ha, ha, ha) |
| d. | Crop water requirement: Kharif( mm/ha, mm/ha, mm/ha, mm/ha, mm/ha), Rabi( mm/ha, ../ha, mm/ha, mm/ha, mm/ha) |
| e. | Land preparation date(day/month): Kharif ( , / , / , / , / ), Rabi ( / , / , / , / , / ) |
| f. | Seed sowing/seedling planting date (day/month): Kharif ( ) |
| g. | Period for raising (in seedling nursery): |
| h. | Frequency and amounts of |
| | 1) Watering (if irrigated, irrigation number and time): |
| | 2) Fertilizer application: |
| | 3) Crop protection: |
| i. | Harvesting period: |
| j. | Post-harvest processing period (on the field): |
| **2.** | **Farm input costs in 2015** |
| a. | Seeds/Seedlings: |
| b. | Chemical fertilizer (crop & Rs./kg/ha/times): ( |
| | Manure (crop & Rs./ton/ha/times): |
| c. | Plant protection (crop & Rs./kg/ha/times): |
| d. | Fuel for irrigation pump (frequency & Rs./liter/ha): |
| e. | Irrigation water(if purchased) crop, frequency & Rs. mm/ha): |
| **3.** | **Labor costs in 2015 on each crop** |
| a. | Gross/permanent (crop & Rs./day, week, month): |
| b. | Gross/Temporal/Part-time (crop & Rs./day, week, month): |

| | |
|---|---|
| c. | Itemized labor costs (crop & Rs./day, week, month, ha) |
| | 1) Land preparation: |
| | 2) Sowing/Planting/Transplanting: |
| | 3) Watering: |
| | 4) Weeding: |
| | 5) Spraying: |
| | 6) Fertilizer application: |
| | 7) Harvesting: |
| | 8) Post-harvest/Processing: Total Rs. |
| | 9) Transportation: |
| **4.** | **Agro-produce storage** |
| a. | Facility types: |
| b. | Conditions of facility at the each farm: |
| c. | At the repository (where produces are collected): |
| **5.** | **Prospective/Expecting crops that farmers will grow after irrigation development** |
| a. | Crops (Select 5 major proposed crops, even current crops can be selected/included): |
| b. | Crops water requirement (each crop): |
| c. | Planned planting area (ha): Kharif (Crop name ha, ha, ha, ha), Rabi ( ha, ha, ha, ha) |
| d. | Estimated gross production (kg/ha): Kharif (Crop name kg/ha, kg/ha, kg/ha, Kg/ha), Rabi ( kg/ha, kg/ha, kg/ha, kg/ha) |
| e. | Estimated/Predicted wholesale price (at the nearest market): Kharif (Crop name Rs. /kg, Crop name Rs. /kg, Crop name Rs. /kg, Crop name Rs. /kg), Rabi (Crop name Rs. /kg, Crop name Rs. /kg, Crop name Rs. /kg, Crop name Rs. /kg) |
| f. | Estimated/Predicted wholesale price (at the nearest town, city/or National average price): Kharif (Crop name Rs. /kg,Crop name Rs. /kg,Crop name Rs. /kg, Crop name Rs. /kg) Rabi (Crop name Rs. /kg,Crop name Rs. /kg,Crop name Rs. /kg, Crop name Rs. /kg) |
| g. | Estimated farm input costs (If prospective/expecting crops are newly introduced, estimate or obtain prices from nearest market place per each expecting crop): |
| | 1) Seeds/seedlings: Kharif (Crop name Rs. /kg, Crop name Rs. /kg, Crop name Rs. /kg, Crop name Rs. /kg), Rabi (Crop name Rs. /kg, Crop name Rs. /kg, Crop name Rs. /kg, Crop name Rs. /kg), Seedling (Crop name Rs. /plant, Crop name Rs. /plant) |

| | |
|---|---|
| | 2) Chemical fertilizer (crop & Rs./kg/ha/times): Kharif (Crop name Rs. /kg ha/ times, Crop name Rs. /kg ha/ times, Crop name Rs. /kg ha/ times, Crop name Rs. /kg ha/ times), Rabi (Crop name Rs. /kg ha times, Crop name Rs. /kg ha/ times, Crop name Rs. /kg ha/ times, Crop name Rs. /kg ha/times), Liquid fertilizer (crop name Rs. /kg ha/ times) |
| | 3) Manure (crop & Rs./kg/ha/times): Kharif (Crop name Rs. /kg ha/ times, Crop name Rs. /kg ha/ times, Crop name Rs. /kg ha/ times, Crop name Rs. /kg ha/ times), Rabi (Crop name Rs. /kg ha times, Crop name Rs. /kg ha/ times, Crop name Rs. /kg ha/ times, Crop name Rs. /kg ha/times) |
| | 4) Pesticide/fungicide/others (crop & Rs./kg/ha/times): Kharif (Crop name Rs. /kg ha/ times, Crop name Rs. /kg ha/ times, Crop name Rs. /kg ha/ times, Crop name Rs. /kg ha/ times), Rabi (Crop name Rs. /kg ha times, Crop name Rs. /kg ha/ times, Crop name Rs. /kg ha/ times, Crop name Rs. /kg ha/times) |
| | 5) Fuel for irrigation pump (crop & Rs./liter/ha/times): (Crop name Rs. / liter/ ha/ times), (Crop name Rs. / liter/ ha/ times), (Crop name Rs. / liter/ ha/ times), (Crop name Rs. / liter/ ha/ times), |
| | 6) Irrigation (crop & cost/liter/ha/times): (Crop name Rs. / l/ ha/ times), (Crop name Rs. / l/ ha/ times), (Crop name Rs. / l/ ha/ times), (Crop name Rs. / l/ ha/ times), (Crop name Rs. / l/ ha/ times), (Crop name Rs. / l/ ha/ times), (Crop name Rs. / l/ ha/ times), |
| h. | Estimated labor costs (per each expecting crop) |
| | 1) Permanent (crop & Rs./day, week, month, year): (Crop name Rs. /day, week, month, year), (Crop name Rs. /day, week, month, year), (Crop name Rs. /day, week, month, year) |
| | 2) Temporal/Part-time (crop & Rs./day, week, month): (Crop name Rs. /day, week, month), (Crop name Rs. /day, week, month), (Crop name Rs. /day, week, month) |
| | Itemized labor costs (crop/ Rs./day, week, month/ha) |
| | 1) Land preparation: (Crop name/Rs. /day, week, month/ ha), (Crop name/Rs. /day, week, month/ ha), (Crop name/Rs. /day, week, month/ ha), (Crop name/Rs. /day, week, month/ ha), (Crop name/Rs. /day, week, month/ ha), (Crop name/Rs. /day, week, month/ ha), (Crop name/Rs. /day, week, month/ ha), (Crop name/Rs. /day, week, month/ ha) |
| | 2) Sowing/planting/transplanting: (Crop name/Rs. /day, week, month/ ha), (Crop name/Rs. /day, week, month/ ha), (Crop name/Rs. /day, week, month/ ha), (Crop name/Rs. /day, week, month/ ha), (Crop name/Rs. /day, week, month/ ha), (Crop name/Rs. /day, week, month/ ha), (Crop name/Rs. /day, week, month/ ha) |
| | 3) Watering: (Crop name/Rs. /day, week, month/ ha), (Crop name/Rs. /day, week, month/ ha), (Crop name/Rs. /day, week, month/ ha), (Crop name/Rs. /day, week, month/ ha), (Crop name/Rs. /day, week, month/ ha), (Crop name/Rs. /day, week, month/ ha), (Crop name/Rs. /day, week, month/ ha), |

| | |
|---|---|
| | 4) Weeding: (Crop name/Rs. /day, week, month/ ha), (Crop name/Rs. /day, week, month/ ha), (Crop name/Rs. /day, week, month/ ha), (Crop name/Rs. /day, week, month/ ha), (Crop name/Rs. /day, week, month/ ha), (Crop name/Rs. /day, week, month/ ha), (Crop name/Rs. /day, week, month/ ha), (Crop name/Rs. /day, week, month/ ha), |
| | 5) Spraying: (Crop name/Rs. /day, week, month/ ha), (Crop name/Rs. /day, week, month/ ha), (Crop name/Rs. /day, week, month/ ha), (Crop name/Rs. /day, week, month/ ha), (Crop name/Rs. /day, week, month/ ha), (Crop name/Rs. /day, week, month/ ha), (Crop name/Rs. /day, week, month/ ha), (Crop name/Rs. /day, week, month/ ha) |
| | 6) Fertilizer application: (Crop name/Rs. /day, week, month/ ha), (Crop name/Rs. /day, week, month/ ha), (Crop name/Rs. /day, week, month/ ha), (Crop name/Rs. /day, week, month/ ha), (Crop name/Rs. /day, week, month/ ha), (Crop name/Rs. /day, week, month/ ha), (Crop name/Rs. /day, week, month/ ha), (Crop name/Rs. /day, week, month/ ha) |
| | 7) Harvesting: (Crop name/Rs. /day, week, month/ ha), (Crop name/Rs. /day, week, month/ ha), (Crop name/Rs. /day, week, month/ ha), (Crop name/Rs. /day, week, month/ ha), (Crop name/Rs. /day, week, month/ ha), (Crop name/Rs. /day, week, month/ ha), (Crop name/Rs. /day, week, month/ ha), (Crop name/Rs. /day, week, month/ ha) |
| | 8) Post-harvest application: (Crop name/Rs. /day, week, month/ ha), (Crop name/Rs. /day, week, month/ ha), (Crop name/Rs. /day, week, month/ ha), (Crop name/Rs. /day, week, month/ ha), (Crop name/Rs. /day, week, month/ ha), (Crop name/Rs. /day, week, month/ ha), (Crop name/Rs. /day, week, month/ ha), (Crop name/Rs. /day, week, month/ ha) |
| | 9) Transportation: (Crop name/Rs. /day, week, month/ ha), (Crop name/Rs. /day, week, month/ ha), (Crop name/Rs. /day, week, month/ ha), (Crop name/Rs. /day, week, month/ ha), (Crop name/Rs. /day, week, month/ ha), (Crop name/Rs. /day, week, month/ ha), (Crop name/Rs. /day, week, month/ ha), (Crop name/Rs. /day, week, month/ ha) |
| **6.** | **Experience in irrigated cultivation** |
| a. | Crop and types (Methods): (Crop name/surface, drip, sprinkler, ), (Crop name/surface, drip, sprinkler, ), (Crop name/surface, drip, sprinkler, ), (Crop name/surface, drip, sprinkler, ), (Crop name/surface, drip, sprinkler, ), (Crop name/surface, drip, sprinkler, ), (Crop name/surface, drip, sprinkler, ), (Crop name/surface, drip, sprinkler, ) |
| b. | Period experienced (Length): (Surface years/drip years/sprinkler years/ years) |
| c. | Specific Techniques (Drip, sprinkler and etc.): |
| **7.** | **Prospective/Expecting irrigation technologies introducing** |
| a. | Types (Methods): Surface/ drip / sprinkler / others |
| b. | Estimated costs (per ha): Rs. /ha |
| **8.** | **Production constrains/Challenges** |
| a. | Technical: e.g. No availability of extension, |
| b. | Socio-economical: e.g. Lack of loans, |

## III. Marketing aspect

| 1. Agro-produces for selling | | | | |
|---|---|---|---|---|
| Commodities (major ones) | | Sales season | QTY | Unit |
| Grains/ Pulses/ oil crops | | | | |
| | | | | |
| | | | | |
| Vegetables | | | | |
| | | | | |
| | | | | |
| Fruits | | | | |
| | | | | |
| | | | | |
| Spices/ Medicinal plants | | | | |
| | | | | |
| | | | | |
| Dairy products | | | | |
| | | | | |
| | | | | |
| Processed food | | | | |
| | | | | |
| | | | | |

| 2. Places of selling agro produces | | |
|---|---|---|
| Places of selling produces | Buyers | Agro produces to sell |
| On farm or At home | | |
| Own retail shops | | |
| Village mandi | | |
| Town (city) mandi | | |
| Cooperatives | | |
| Contract buyers | | |
| Government collection center | | |
| Others:..... | | |

| 3. Transportation from your places to places of selling and transportation cost | | |
|---|---|---|
| Mean (check the boxes) | Transportation cost (Rs./unit) | Loading/unloading cost (unit) |
| ☐ On foot | | |

| | | |
|---|---|---|
| ☐ Own cart/motorcycle/truck | | |
| ☐ Hired cart/motorcycle/truck | | |
| ☐ Public transportation | | |
| ☐ Buyers' transportation | | |
| ☐ Others:---------- | | |

**4. Price determination and negotiation**

| Situation (check the boxes) | For which agro produces? | With or by which buyers? |
|---|---|---|
| ☐ I determine selling prices by myself | | — |
| ☐ I negotiate selling prices with buyers | | |
| ☐ Buyers determine prices | | |

**5. Marketing options**

| Situation | Circle the answer |
|---|---|
| Are you belonging to a FPO/FIG or other marketing group? | Yes or No |
| If **Yes**, do you have opportunities to directly negotiate with buyers as group? | Yes or No |
| If **No**, are you interested in having such opportunities? | Yes or No |
| Have you ever used services for agro produces distribution directly to consumers (e.g. Drishtee) or services for marketing information (e.g. e-choupal)? | Yes or No |
| If **No**, are you interested in using such services? | Yes or No |
| If **Yes**, please specify the name(s) of the service(s) | |
| How do you like it? | |

**6. Marketing constrains/Challenges that interviewed farmers are facing**

Please check the boxes

☐ Middlemen require additional charge for marketing.
☐ Transportation cost is too high.
☐ I have no access to price information.
☐ I have no access to market trend (traders'/customers' preference).
☐ I have no technical knowledge for quality improvement.
☐ I don't know where I can sell large quantity of agro produces at good prices when I gather a plentiful harvest.
☐ Others if any:

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## IV. Gender aspect

### A. Question to Male Interviewee or husband of the interviewee

| | | | |
|---|---|---|---|
| **1.** | **Background information** | | |
| a. | Involved in agriculture or not?: Full-time farmer, Part-time farmer, Not farmer having another job ( ) | | |
| b. | Age: | | |
| c. | Education/literacy: Can read, Just literate, Class ( ), Others ( ) | | |
| d. | Land ownership<br>1) Owned land Area:<br>Irrigated (unit: ha or Bigha) \| Not irrigated (unit: ha or Bigha)<br>2) Reasons why you own land:<br>3) Who will succeed your land?: | | |
| **2.** | **Do you attend community meeting?** | | |
| a. | If yes, how often and which meeting? | | |
| b. | If no, why? | | |
| **3.** | **Roles and responsibilities on farm work**<br>0:Not at all, 1: Support occasionally, 2 Support every time, 3: Mainly do | **Male** | **Female** |
| a. | Name of crop: Veg ( ) or Mustard or Wheat | | |
| b. | Land preparation (cleaning) | | |
| c. | Land preparation (plowing) by hand or by machine, by animal | | |
| d. | Fertilizer application | | |
| e. | Seed sowing (by hand or by machine) | | |
| f. | Transplanting, if required | | |
| g. | Watering | | |
| h. | Weeding (by hand or by machine) | | |
| i. | Spraying | | |
| j. | Harvesting (by hand or by machine) | | |
| k. | Post-harvest/processing (dry) | | |
| l. | Post-harvest/processing (packing) (by hand or by machine) | | |
| m | Post-harvest/processing (cleaning) (by hand or by machine) | | |
| n. | Transportation (field to house) by private transportation or by public transportation | | |
| o. | Transportation (house to market) by private transportation or by public transportation | | |
| p. | Sales (place: ) | | |

| 4. | **Roles and responsibilities on house and social work**<br>0:Not at all, 1: Support occasionally, 2 Support every time, 3: Mainly do | **Male** | **Female** |
|---|---|---|---|
| a. | Cooking | | |
| b. | Cleaning | | |
| c. | Fetching water | | |
| d. | Fetching firewood | | |
| e. | Washing clothes | | |
| f. | Caring for children (if you have) | | |
| g. | Caring for elder (if you have) | | |
| h. | Caring for sick (if you have) | | |
| i. | Caring for goat (if you have) | | |
| j. | Caring for cattle (if you have) | | |
| k. | Maintenance of house | | |
| l. | Networking with neighbors | | |
| m | Attending community meeting | | |

**5. Please briefly explain about your daily activities from morning to evening**

| | **Farming season** | | **Off season** | |
|---|---|---|---|---|
| | **Time** | **Activity** | **Time** | **Activity** |
| | | Wake up | 5:00 am | Wake up |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

**6. Please briefly explain about decision making on the following items**

**0: Not at all, 1: Only sometimes, 2: Often, 3:Mainly**

| **Resources/property** | | **Who can use it?(access)** | | **Who decide on it?(control)** | |
|---|---|---|---|---|---|
| | | **Male** | **Female** | **Male** | **Female** |
| a. | Farm land | | | | |
| b. | House | | | | |
| c. | Farming tools | | | | |
| d. | Agri. machineries | | | | |
| e. | Farm input (seed, fertilizer, etc.) | | | | |

| | | | | | |
|---|---|---|---|---|---|
| f. | Cattle/buffalo/camel | | | | |
| g. | Chicken/duck | | | | |
| h. | Goat/sheep | | | | |
| i. | Farm products | | | | |
| j. | House expenditure | | | | |
| k. | School fee | | | | |
| l. | Cash/income | | | | |

| | | |
|---|---|---|
| **7.** | **Have you ever received any training in gender?** | |
| a. | When | |
| b. | How long | |
| c. | Where | |
| d. | By whom (organization, project, etc.) | |
| e. | Contents: | |
| f. | Changes resulting from the training(if any): | |
| **8.** | **Agricultural Extension Services (Have you ever get any agricultural extension services?)** | |
| a. | Types (Technical, Financial, management etc.: | |
| b. | Public/Private and location of their office(s): | |
| c. | The names of DAO and FEOs (Frontline Extension Officers): | |
| d. | Availability (frequency of the agent/officer's visit): | |
| **9.** | **Marketing information** | |
| a. | Experience on using market information: Yes (how often? ), No | |
| b. | Means to get information: | |

## V. Gender aspect

### B. Question to Female Interviewee or wife of the interviewee who is involved in agriculture

| | |
|---|---|
| **1.** | **Background information** |
| a. | Involved in agriculture or not?: Full-time farmer, Part-time farmer, Not farmer having another job ( ) |
| b. | Age: |
| c. | Education/literacy: Can read, Just literate, Class ( ), Others ( ) |
| d. | Land ownership<br>1) Owned land Area: |

| Irrigated (unit: ha or Bigha) | Not irrigated (unit: ha or Bigha) |
|---|---|
| | |

2) Reasons why you own land:

| | | | |
|---|---|---|---|
| | 3) Who will succeed your land?: | | |
| **2.** | **Do you attend community meeting?** | | |
| a. | If yes, how often and which meeting? | | |
| b. | If no, why? | | |
| **3.** | **Roles and responsibilities on farm work**<br>0:Not at all, 1: Support occasionally, 2:Support every time, 3: Mainly do | **Male** | **Female** |
| a. | Name of crop ( same as VI-3a): | | |
| b. | Land preparation (cleaning) | | |
| c. | Land preparation (plowing) | | |
| d. | Fertilizer application | | |
| e. | Seed sowing (by hand or by machine) | | |
| f. | Transplanting, if required | | |
| g. | Watering | | |
| h. | Weeding (by hand or by machine) | | |
| i. | Spraying | | |
| j. | Harvesting (by hand or by machine) | | |
| k. | Post-harvest/processing (dry) | | |
| l. | Post-harvest/processing (packing) (by hand or by machine) | | |
| m | Post-harvest/processing (cleaning) (by hand or by machine) | | |
| n. | Transportation (field to house) (by private transportation or by public transportation) | | |
| o. | Transportation (house to market) by private transportation or by public transportation) | | |
| p. | Sales (place: ) | | |
| **4.** | **Roles and responsibilities on house and social work**<br>0:Not at all, 1: Support occasionally, 2 Support every time, 3: Mainly do | **Male** | **Female** |
| a. | Cooking | | |
| b. | Cleaning | | |
| c. | Fetching water | | |
| d. | Fetching firewood | | |
| e. | Washing clothes | | |
| f. | Caring for children (if you have) | | |
| g. | Caring for elder (if you have) | | |
| h. | Caring for sick (if you have) | | |
| i. | Caring for goat (if you have) | | |
| j. | Caring for cattle (if you have) | | |

| | | | |
|---|---|---|---|
| k. | Maintenance of house | | |
| l. | Networking with neighbors | | |
| m | Attending community meeting | | |

**5. Please briefly explain about your daily activities from morning to evening**

| | Farming season | | Off season | |
|---|---|---|---|---|
| | **Time** | **Activity** | **Time** | **Activity** |
| | | Wake up, | | |
| | | | | |
| | | | | |
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| | | | | |
| | | | | |
| | | | | |
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| | | | | |
| | | | | |

**6. Please briefly explain about decision making on the following items**

**0: Not at all, 1: Only sometimes, 3: Often, 2:Mainly**

| | Resources/property | Who can use it? (Access) | | Who decide on it? (control) | |
|---|---|---|---|---|---|
| | | **Male** | **Female** | **Male** | **Female** |
| a. | Farm land | | | | |
| b. | House | | | | |
| c. | Farming tools | | | | |
| d. | Agri. machineries | | | | |
| e. | Farm input (seed, fertilizer, etc.) | | | | |
| f. | Cattle/buffalo/camel | | | | |
| g. | Chicken/duck | | | | |
| h. | Goat/sheep | | | | |
| i. | Farm products | | | | |
| j. | House expenditure | | | | |
| k. | School fee | | | | |

| | | | | | |
|---|---|---|---|---|---|
| l. | Cash/income | | | | |
| **7.** | **Have you ever received any training in gender?** | | | | |
| a. | When: | | | | |
| b. | How long: | | | | |
| c. | Where: | | | | |
| d. | By whom (organization, project, etc.): | | | | |
| e. | Contents: | | | | |
| f. | Changes resulting from the training(if any): | | | | |
| **8.** | **Agricultural Extension Services (Have you ever get any agricultural extension services?)** | | | | |
| a. | Types (Technical, Financial, management etc.: | | | | |
| b. | Public/Private and location of their office(s): | | | | |
| c. | The names of DAO and FEOs (Frontline Extension Officers): | | | | |
| d. | Availability (frequency of the agent/officer's visit): | | | | |
| **9.** | **Marketing information** | | | | |
| a. | Experience on using market information: Yes (how often? ), No | | | | |
| b. | Means to get information: | | | | |

*Attachment 2.6.1*

*List of Units at Kota Agro Food Park*

Attachment 2.6.1: List of Units at Kota Agro Food Park (original)

## OFFICE OF THE REGIONAL MANAGER, RIICO LTD., RANPUR, KOTA (RAJ.)

## LIST OF ALLOTMENT OF AGRO FOOD PARK Ist, IND. AREA, RANPUR, (RAJ.)

| S. No. | Name of Party | Address | Plot No | | Area (In Sqm.) | Date of Allotment | Products | Category |
|---|---|---|---|---|---|---|---|---|
| | | | Plot No. | No. of Plots | | | | |
| 1 | M/s Rashmi Agro Industries | Prop. Miss. Rashmi Joshi D/o Sh. N.B. Joshi, MPB-1, Mahaveer Nagar-Ist, Kota | $G_1$- 4 Corner | 1 | 1000.00 | 12.05.03 | Masala Grinding | Women |
| 2 | M/s Shah Agro Pluse Pvt. Ltd. | 252, Shopping Centre, Kota (Raj.)(Director) Smt. Shweta Jain 9314457583 | G1-11 | 1 | 1000.00 | 12.05.03 | Grain Grading | Women |
| 3 | M/s Annapurna Industries | R/o A-602, Talwandi, Kota (Raj.)Prop. Smt. Durga Devi 9829035574 | $G_1$- 12 | 1 | 1000.00 | 12.05.03 | Seed Grading | Women |
| 4 | M/s Anubhav Industries | Prop. Smt. Chelna Devi Prop. Smt. Chelna Devi W/o Sh. Manohar Lal Ji, E-814, Indira Vihar, Kota (Raj.) | F-15 | 1 | 1950.00 | 17.07.04 | Grain Grading | Women |
| 5 | M/s Manbhar Devi Agro Industries | Prop. Smt. Manbhar Devi W/o Sh. Late Sh. Ramswaroop Mehta, 30/377, Mehta Bhawan, Kotari Gowardhanpura, Kota (Raj.) | F-21 | 1 | 2000.00 | 12.05.03 | Wheat & Dhaniya Grading | Women |
| 6 | M/s Monohari Devi Agro Industries | Prop. Smt. Manohari Devi W/o Sh. Ghanshyam Das Mehta, 30/377, Mehta Bhawan, Kotari Gowardhanpura, Kota (Raj.) | F-22 | 1 | 2000.00 | 12.05.03 | Wheat & Dhaniya Grading | Women |

subsidies in plots promoters

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 7 | M/s Rukamani Devi Agro Ind. | Prop. Smt. Rukmani Devi Mehta W/o Sh. Banshi Dhar Mehta, 30/377, Mehta Bhawan, Kotari, Gowardhanpura, Kota (Raj. | F-23 | 1 | 2000.00 | 12.05.03 | Wheat & Dhaniya Grading | Women |
| 8 | M/s Girnar Agro | Prop. Smt. Kamala Devi W/o Sh. Late Sh. Prem Singh Singhvi, Girnar Bhawan, Rampura, Kota (Raj.) | F-24 | 1 | 1950.00 | 21.07.04 | Dhaniya Grading | Women |
| 9 | M/s Sheetal Agrotech P.Ltd. | Director, Smt. Sweta Jain W/o D.C. Jain , E-814, Indra Vihar, Kota (Raj.) | E-30 | 1 | 4000.00 | 17.07.04 | Dhaniya Grading | Women |
| 10 | M/s P.P. Agro Industries | Partner Smt. Rajkumari Sharma W/o Sh. Narendra Kumar Sharma, Near Mouri Ke Hanuman ji, Ghandi Chowk, Rampura, Kota (Raj.) | F-36 | 1 | 1950.00 | 17.07.04 | Dhaniya Grading | Women |
| 11 | M/s Ashok Agro | Prop. Smt. Gayatri Mehta W/o Late Sh. Ashok Mehta, 30/377, Mehta Bhawan, Gowardhanpura, Kota (Raj.) | F-40 | 1 | 1950.00 | 20.07.04 | | Women |
| 12 | M/s Sanmaty Industries | Partner Smt. Mohan Devi W/o Sh. B.D. Natani, 3-A, Talwandi, Kota (Raj.) | G-49 | 1 | 1738.00 | 14.08.03 | Grain Grading | Women |
| 13 | M/s Bajarang Agro Ind. | Prop. Smt. Sulochana Devi W/o Sh. Jagdish Sharma R/o 18, Shiv Nagar, Police Line, Baran Road, Kota (Raj.) | G-51 | 1 | 1500.00 | 17.07.04 | Spices | Women |
| 14 | M/s Lakhotia Agrotech P.Ltd. | (Director) Smt. Lata Lakhotia D/o Sh. G.D. Rathi, 7-B-32, Mahaveer Nagar IIIrd, Kota (Raj.) | G-52 | 1 | 1400.00 | 17.07.04 | Dhaniya Grading | Women |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 25 | M/s Jain Industries | Partner Smt. Indu Jain W/o Sh. Pawan Kumar Jain R/o 1556-A, R.K.Puram, Kota (Raj.) | $H_1$-83 | 1 | 741.00 | 23.02.04 | Masala Grinding | Women |
| 26 | M/s Mamta Masala Udyog | Prop. Smt. Mamta Agarwal W/o Sh. Hari Prasad Agarwal, Subhash Nagar, Nanta Road, Kunhadi, Kota (Raj.) | $H_1$-84 | 1 | 525.00 | 14.08.03 | Masala Grinding | Women |
| 27 | M/s Shree Ram Industeis | Prop Smt. Sumitra soni W/o Sh. Vijay kumar soni, 150 Pratap nagar, Dadabari kota (Raj.) | $H_1$-87 | 1 | 500.00 | 06.06.03 | Seed Grading | Women |
| 28 | M/s Shree Ram Industeis | Prop Smt. Sumitra soni W/o Sh. Vijay kumar soni, 150 Pratap nagar, Dadabari kota (Raj.) | $H_1$-88 | 1 | 500.00 | 06.06.03 | Seed Grading & Dhaniya Grading | Women |
| 29 | M/s Porwal Industries | Prop. Smt. Manju Jain W/o Sh. Kamal Kumar Jain, 154, Shakti Nagar, Dadabari, Kota (Raj.) | $H_1$-89 | 1 | 525.00 | 14.08.03 | Spices Grinding | Women |
| 30 | M/s Neelam Food Product | Prop. Smt. Neelam Saxena W/o Sh. Harish Kumar Saxena, 1-E-20, Talwandi, Kota (Raj.) | G1-94 | 1 | 1376.00 | 31.03.04 | Pickles | Women |
| 31 | M/s Love Kush Meena | Prop.Smt. Sharda Meena W/o Sh. Mukesh Meena, V-58, Jawahar Nagar, Kota (Raj.) | G1-95 | 1 | 1000.00 | 16.09.05 | Dhaniya Grading | Women |
| 32 | M/s Jayant Food | Prop. Smt. Mamta Jain W/o Sh. Manoj Jain, C-144, Bhamashah Mandi, Kota (Raj.) | G1-96 | 1 | 1000.00 | 16.09.05 | Seed Grading | Women |
| 33 | M/s Aashirwad Industries | Prop. Smt. Vidhya Devi W/o Sh. Chandra Prakash, 4-A-33, Mahaveer Nagar (Extn.), Kota (Raj.) | $G_1$-99 | 1 | 1376.00 | 13.07.04 | Tilly Processing | Women |
| 34 | M/s SIR Gangaram | Prop. Sa | G1-102 | 1 | 1000.00 | 15.07.09 | | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 35 | M/s Anapurana Industries | Prop. Smt. Seema Maheshwari W/o Sh. Pramod Maheshwari R/o 17/260, Brijrajpura, Kota (Raj.) | $G_1$-103 | 1 | 1376.00 | 20.07.04 | Seed Grading | Women |
| 36 | M/s Raj Agro Ind. | Prop. Smt. Rajkumari Jain W/o Sh. Ashok Kumar Jain, 119- New Grain Mandi, Kota (Raj.) | H1-119 | 1 | 500.00 | 14.08.03 | Dhaniya Grading | Women |
| 37 | M/s Deep Agro Food Company | Prop. Smt. Anjana Agarwal W/o Sh. Shyam Sunder Agarwal, B-311, Talwandi kota (Raj.) | $H_1$-125 | 1 | 500.00 | 21.07.04 | Papad Potato Chips, Anwala Juice | Women |
| 38 | M/s Deep Industries | Prop. Smt. Beena Agarwal W/o Sh. Naval kishore Agarwal B-11, Talwandi kota (Raj.) | $H_1$-126 | 1 | 500.00 | 21.07.04 | Papad Potato Chips, Anwala Juice | Women |
| 39 | M/s Vibhuti Agro Tech Pvt. Ltd. | (Director) Smt. Vibhuti Sharma W/o Sh. Rajendra Kumar Sharma, 1-Ta-5, Dadabari (Extn.), Kota (Raj.) | H1-129 | 1 | 625.00 | 21.07.04 | Seed Grading | Women |
| 40 | M/s Samit Agro Tech Pvt. Ltd. | (Director) Smt. Preeti Sharma W/o Sh. Samit Sharma, 1-Ta-5, Dadabari (Extn.), Kota (Raj.) | H1-130 | 1 | 625.00 | 21.07.04 | Seed Procesing | Women |
| 41 | M/s Niharika Food Agro | Prop. Smt. Rachana Sharma W/o Sh. Prabhat sharma, 69 Railway housing society, Mala road Kota Junction, kota | H1-132 | 1 | 500.00 | 07.09.09 | Aata (Flour) | Women |
| 42 | M/s Kiran Enterprises | Prop. Smt. Kiran Jain W/o Sh. Rakesh Jain R/o 1-Tha-10, Vigyan Nagar, Kota (Raj.) | $H_1$-135 | 1 | 500.00 | 21.07.04 | Soyabean Milk & Product | Women |
| 43 | M/s Jay Enterprises | Partner, Miss Gunjan Chaturvedi D/o Sh. Kalicharan Chaturvedi, 314-A, Talwandi, Kota (Raj.) | $H_1$-141 | 1 | 625.00 | 01.07.04 | Grain Grading | Women |

# LIST OF ALLOTMENT OF AGRO FOOD PARK PHASE-II, RANPUR, KOTA (RAJ.)

| S. No. | Name of Party | Address | Contact No. | Plot No | | Area (In Sqm.) | Date of Allotment | Category | Zone (Geneal/ Wet) |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Plot No. | No. of Plots | | | | |
| 1 | M/s Shah Agri Solutions | Prop. Smt. Seema Jain W/o Om Prakash , R/o E-814, Indira Vihar, Kota | 9314457583 | F-155 | 1 | 2000.81 | 24.09.10 | Woman | Gen. |
| 2 | M/s Shah Cold Storage | Prop. Smt. Chelna Devi W/o Sh. Manohar Lal Jain, R/o E-814, Indira Vihar, Kota | 9414186583 | F-156 | 1 | 2000.81 | 24.09.10 | Woman | Gen. |
| 3 | M/s Munmun Industries | Prop. Smt. Devaki Bai W/o Satyaprakash, R/o 2-P-3, Teachers Colony, Keshavpura, Kota | 9351748479 | F-158 | 1 | 2000.81 | 21.09.10 | S.C. | Gen. |
| 4 | M/s Jai Ambey Industries | Prop. Smt. Sharda Meena W/o Mukesh Meena,R/o V-58, Jawahar Nagar, Kota | 9414365666 | F-159 | 1 | 2000.81 | 21.09.10 | S.T. | Gen. |
| 5 | M/s S.K. Traderes | Prop. Smt. Dropati Khandelwal W/o Sh. Suresh Khandelwal R/o 1-r-16, Teachers Colony, Keshavpura, Kota | 9414183989 9887483989 0744-2400158 | F-161 | 1 | 2000.81 | 07.07.10 | Woman | Gen. |
| 6 | M/s Shree Kailash Ganga Ind. | Prop. Smt. Rekha Vijay W/o Sh. Surendra Vijay, R/o 1-Ka-31, Vigyan Nagar (N.H.12), Kota (Raj.) | 9414180028 | H1-185 | 1 | 510.00 | 18.10.10 | Woman | Wet |
| 7 | M/s Nu Industries | Prop. Smt. Uma Vijay W/o Sh. Narendra Vijay, R/o A-205, Talwandi, Kota (Raj.) | 0744-2427205 | H1-186 | 1 | 510.00 | 25.10.10 | Woman | Wet |
| 8 | M/s Aarti Enterprises | Prop. Smt. Aarti Malik W/o Harish Malik, R/o C-630, Indira Vihar, Kota (Raj.) | 9251285075 | H1-187 | 1 | 510.00 | 15.11.10 | Woman | Wet |
| 9 | M/s Dholpur Gazak Bhandar | Prop. Smt. Rajni Goyal W/o Sh. Mukesh Goyal, R/o 7-M-17, Mahaveer Nagar IIIrd, Kota | 9829544825 | $H_1$-189 | 1 | 510.00 | 28.09.10 | Woman | Wet |
| 10 | M/s Vaishnavi Sales | Prop. Smt. Prerana Mehatani W/o Sh. Vijay Mehatani, R/o 3-N-5, Talwandi, Kota | 9314487917 0744-2421101 | $H_1$-190 | 1 | 510.00 | 28.09.10 | Woman | Wet |
| 11 | M/s Sahyog International | Prop. Smt. Sangeeta Nyati, R/o 1-E-23, Housing board Colony, Kunhadi, Kota | 9413352972 0744-2372971 0744-2372972 | $H_1$-192 | 1 | 510.00 | 12.07.10 | Woman | Wet |
| 12 | M/s Kairaly Garlic Centre | Prop. Smt. Lisamma W/o Sh. Sabastion, R/o S-36, I.P.I.A., Road No. 5, Kota | 9828214412 | $H_1$-193 | 1 | 500.00 | 05.10.10 | Woman | Wet |
| 13 | M/s Anupama Industries | Prop. Smt. Anupama Nirmal Sharma W/o Dr. Nirmal Sharma, R/o 10-D, Krishna Enclave, Civil Line, Kota | 9414127445 0744-2333436 | H1-194 | 1 | 500.00 | 21.09.10 | Woman | Wet |
| 14 | M/s Tanvi Industries | Prop. Smt. Mamta Gochar W/o Sh. Anurag Gochar, R/o 7-C-34, Mahaveer Nagar IIIrd, Kota | 9829231725 | H1-195 | 1 | 500.00 | 21.09.10 | Woman | Wet |
| 15 | M/s Santosh Ice-Cream | Prop. Smt. Santosh Chaudhary W/o C.R. Chaudhary, R/o F-379, Indira Vihar, Kota (Raj.) | 8955679384 9414185222 | H1-197 | 1 | 500.00 | 10.01.11 | Woman | Wet |
| 16 | M/s Ganesh Enterprises | Prop. Smt. Harsha Gera W/o Sh. Dilip Gera, R/o H.No. 50, Ashoka Colony, Gumanpura, Kota (Raj.) | 9414187211 | H1-199 | 1 | 500.00 | 28.12.10 | Woman | Wet |
| 17 | M/s Saniya Enterprises | Prop. Smt. Anju Gera W/o Sh. Satish Kumar Gera R/o H.No. 505, Vivekanand Nagar, Kota (Raj.) | 9602558250 | H1-200 | 1 | 500.00 | 28.12.10 | Woman | Wet |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | M/s Madnawat Agro Ind. | Prop. Smt. Premlata Mandawat W/o Sh. Mohan Chand Mandawat, R/o Manave Sewa Samiti Hospital Road, Gobriya Bawari, Kota | 9636407240 | $H_1$-205 | 1 | 500.00 | 23.09.10 | S.C. | Gen. |
| 19 | M/s R.M. Ind. | Prop. Smt. Madhu Sharma W/o Raghvendra Bihari Sharma, R/o 16/128, Bajaj Khana, Kota | 9414180621<br>0744-2380124 | H1-212 | 1 | 500.00 | 05.08.10 | Woman | Gen. |
| 20 | M/s Ujjwal Agro Ind. | Prop. Smt. Sunita Devi Ghoote W/o Sh. Hari Shankar, R/o 462, Mahaveer Nagar- Ist, Kota | 0744-2433461 | $H_1$-214 | 1 | 500.00 | 31.08.10 | S.C. | Gen. |
| 21 | M/s Bagdi Seed & Grading Ind. | Prop. Smt. Geeta Bai W/o Sh. Rameshwar Bagdi R/o 17, Ambedkar Nagar, Near D.A.V. School, Talwandi, Kota | 9414936872 | $H_1$-215 | 1 | 500.00 | 21.09.10 | S.C. | Gen. |
| 22 | M/s Mahendra Kumar Animesh Kumar | Prop. Smt. Indra Jain W/o Mahendra Jain, R/o C-339, Indira Vihar, Kota (Raj.) | 9928619121<br>0744-2490352 | G-222 | 1 | 1545.00 | 20.10.10 | Woman | Gen. |
| 23 | M/s Yogi Flour Mill | Prop. Smt. Lalita Yogi W/o Sh. Prem Prakash Yogi, R/o H.No. 628 "Nathu Sadan" Dhudhari Marg, Ladpura, Kota (Raj.) | 9414242356 | G-225 | 1 | 1545.00 | 22.12.10 | Woman | Gen. |
| 24 | M/s Jain Foods | Prop. Smt. Soneesha Jain W/o Sh. Nitin Jain, R/o 2-Kha-9, Vigyan Nagar, Kota (Raj.) | 9414180620<br>0744-2420620 | G-230 & G-231 | 2 | 3000.00 | 10.12.10 | Woman | Gen. |
| 25 | M/s Kanhiya Lal Agro Industries | Prop. Smt. Kamlesh Meena W/o Sh. Yogesh Meena, R/o 32- New Jawahar Nagar, Kota (Raj.) | 9414183527 | G-232 | 1 | 1500.00 | 16.12.10 | S.T. | Gen. |
| 26 | M/s Swastic Associates | Prop. Smt. Sapna Saklecha W/o Sh. Niraj Saklecha,R/o E-72, New Jawahar Nagar, Kota (Raj.) | 9829036433<br>0744-2439054 | G-234 | 1 | 1500.00 | 06.12.10 | Woman | Gen. |
| 27 | M/s Dinesh Gas Agencies | Prop. Smt. Durgesh Sharma W/o Late Sh. (Major) D.D. Sharma, R/o 1-T-14, Vigyan Nagar, Kota (Raj.) | 9983339938<br>0744-2437939 | G-236 | 1 | 1500.00 | 06.12.10 | Woman | Gen. |
| 28 | M/s Goyal Agro Group | (Partner) Smt. Radha Goyal W/o Sh. Natthi Goyal, R/o 83- New Grain Mandi, Kota | 9413116844<br>0744-2363926<br>0744-2364375 | G-245 | 1 | 1539.00 | 08.11.10 | Woman | Gen. |
| 29 | M/s Paraliya Industries | Prop. Smt. Sulochana Meena W/o Sh. Giriraj Prasad Meena, R/o Village Napahera, Post Kishorpur, Tehsil Digod, District Kota | 9414725839 | F-250 | 1 | 1986.00 | 07.10.10 | S.T. | Gen. |
| 30 | M/s Jai Shree Roller Flour Mill | Prop. Smt. Anita Meena W/o Sh. Rameshwar Meena, R/o 149, Chharakvada Ke Raste Par, Kodija, Tehsil Keshavrai Patan, District Bundi (Raj.) | 8094444877 | G-257 | 1 | 1500.00 | 25.10.10 | S.T. | Gen. |
| 31 | M/s Piyush Associates | Prop. Smt. Manju Jain W/o Sh. Hemant Kumar Jain, 65- New Grain Mandi, DCM Road, Kota | 9829036451 | G-264 & G-265 | 2 | 3096.00 | 03.11.10 | Woman | Gen. |
| 32 | M/s Smriti Industries | Prop. Smt. Kailash Devi W/o V.K. Chaoudhary, R/o 3/140 Ganesh Talab, Kota | 9460494175 | G-266 | 1 | 1548.00 | 05.10.10 | Woman | Gen. |
| 33 | M/s Yash Agro Biotech | Prop. Smt. Chinkal Khotari W/o Sh. Sanjeev Kothari, R/o 1-Ch-26 & 27, Dadabari, Kota | 9652831999<br>0744-2503335 | G-268 | 1 | 1548.00 | 03.11.10 | Woman | Gen. |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 34 | M/s S.R. Enterprises | Prop. Smt. Pratima Sharma W/o Sh. Shashi Bhardwaj, R/o 211, Shiv Shakti Paradise Central Spine Vidyadhar Nagar, Jaipur –302 023 (Raj.) | 9314084249 | G-273 | 1 | 1500.00 | 15.12.10 | Woman | Gen. |
| 35 | M/s R.K. Industries | Prop. Smt. Rama Vijay W/o Sh. Ramesh Chand Vijay, R/o 2-L-10, Talwandi, Kota | 9783447000 | G-278 | 1 | 1500.00 | 21.09.10 | Woman | Gen. |
| 36 | M/s Maa Parvati Agro Foods | Prop. Smt. Maya Mangal W/o Sh. Hukum Chand Mangal, R/o 2-R-15, Talwandi, Kota | 94141-85222 | G1-284 | 1 | 984.54 | 05.10.10 | Woman | Gen. |
| 37 | M/s Triveni Foods | Prop. Smt. Kusum Gupta W/o Sh. Umesh Gupta, R/o B-416, Indira Vihar, Kota | 9414185222 | G1-285 | 1 | 984.54 | 05.10.10 | Woman | Gen. |
| 38 | M/s Astha Techno Eatables | Prop. Smt. Kalpana Bhatnagar W/o Puneet Bhatnagar,R/o D-408, Indira Vihar Kota | 9414185222 | G1-286 | 1 | 983.93 | 05.10.10 | Woman | Gen. |
| 39 | M/s Mannat Agro | Prop. Smt. Archana Saroya W/o Dr. Sh. Jasvinder Saroya, R/o B-324, Indira Vihar, Kota | 0744-2427055 | G1-287 | 1 | 983.32 | 11.10.10 | Woman | Gen. |
| 40 | M/s Asha Foods Processing Ind. | Prop. Smt. Asha Devi W/o Kailash , R/o B-416, Indira Vihar, Kota | 9414185222 | G1-288 | 1 | 983.32 | 07.10.10 | Woman | Gen. |
| 41 | M/s K.N. Spices | Partner Kumari K.P. Liya D/o Late Sh. K.P. Pappachan,R/o 2-C-9, Mahaveer Nagar IIIrd, Kota | 9829230090 0744-2476053 | G1-290 | 1 | 983.32 | 03.11.10 | Woman | Gen. |
| 42 | M/s Parvez Spices | Prop. Smt. Hazra Begum W/o Sh. Saleem Akhtar, R/o 646, Teliyon Ka Mohalla, Chawani, Ramchandrapura, Kota (Raj.) | 9166442468, 9414182468, 0744-2362559 | G1-291 | 1 | 983.32 | 25.10.10 | Woman | Gen. |
| 43 | M/s Roma Agrotech | Prop. Smt. Vandana Singhal W/o Sh. Ashok Kumar Singhal, R/o 4-K-7, Talwandi, Kota (Raj.) | 9414788822 | G1-293 | 1 | 1162.50 | 06.01.11 | Woman | Gen. |
| 44 | M/s Kothari Agro Industries | Prop. Kumari Nisha Kothari D/o Sh. Anil Kothari, R/o 260-C, Talwandi, Kota (Raj.) | 9413009323 0744-2406026 | G1-295 | 1 | 1101.25 | 26.11.10 | Woman | Gen. |
| 45 | M/s Pushpa Industries | Prop. Smt. Pushpa Devi W/o Sh. Khem Chand, R/o 2-F-15, Talwandi, Kota (Raj.) | 9785421472 | G1-297 | 1 | 1050.62 | 15.11.10 | Woman | Gen. |
| 46 | M/s Aurshi Ind. | Prop. Smt. Seema Mehra, R/o 53-A, Talwandi, Kota | 9829058791 0744-2425866 | $G_1$ - 300 | 1 | 1000.00 | 07.07.10 | Woman | Gen. |
| | | **Total No. of Plots** | | | **48** | | | | |

*Source: Rajasthan State Industrial Development & Investment Corporation Ltd. (RIICO)*

*Attachment 2.6.2*
*List of Units at Sri Ganganagar*
*Agro Food Park*

Attachment 2.6.2: List of Units at Sri Ganganagar Agro Food Park (original)

# OFFICE OF THE REGIONAL MANAGER RIICO LTD., UDYOG VIHAR, SRIGANGANAGAR

No: 7775
Dated: 10.03.2016

Additional General Manager (Business Promotion)
RIICO Ltd.,
Udyog Bhawan, Tilak Marg,
Jaipur.

BP-2982 11/3/16

Sub:- List of units functioning in Agro Food Park, products manufactured and investment proposed in the project.
Ref:- Your email dated 09-03-2016

Sir,

In reference to above cited subject the list of unit functioning in Agro Food Park, products manufactured and investment proposed in the project for use in answering Vidhan Sabha-2016. The list is furnished in prescribed format as under:-

11456 11.3.16 BP Cell

| S. no. | Name of the unit | Contact details (Mobile/email) | Plot no. | Area ( in sqm.) | Product(s) | Investment proposed (in lacs) | Employment proposed |
|---|---|---|---|---|---|---|---|
| 1. | M/s. Om Traders<br>Pro. Smt. Nirmla Devi | 9414089815 | E-254 | 3600 | Warehouse | 50 | 13 |
| 2. | M/s.Vikas W.S.P.<br>Pro. Sh. B.D.A. Grawal | 0154-2494361 | E-255, 256 & 257 | 12000 | Gaur Gum | 100 | 250 |
| 3. | M/s. Kubar Warehouse & Food Pro. Co. Pvt. Ltd.<br>Director. Sh. Sanjay | 93513-26001 | E-258 & 259 | 7700 | Food Processing & Ware house unit | 137.50 | 10 |
| 4. | M/s. Arihant Oil & General Mills | 01624-223091 | H1-298 (B), (C) H1-298, E -299, | 5500 | Mustered Oil | 40 | 15 |
| 5. | M/s.Surya Gold Agro Foods<br>Pro. Sh. Amit Goyal | 94140-91218 | E-300 | 4000 | Grain Grading | 50 | 20 |

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|---|---|---|---|---|---|---|---|
| 6. | M/s. Jaidev Mailiables<br>Pro. Sh. Sh. Jaidev | 94140-88944 | F-303 | 1718 | Grain Grading | 45 | 9 |
| 7. | M/s. Surya Gold Agro Foods<br>Pro. Sh. Amit Gupta | | F-304 | 2183 | Grain Grading | 50 | 10 |
| 8. | M/s. K.C. Agro Food<br>Pro. Smt.Neha Goyal | 98728-96306 | F-305,306 &<br>H1- 307(A), (B),<br>H1- 308(A), | 5090 | Mustard Oil | 25 | 5 |
| 9. | M/s. Dev Industries<br>Pro. Smt. Sunita | 99838-36509 | H1-308 (B) | 500 | Flour Mill | 40 | 5 |
| 10. | M/s. Shree Ram Seeds Pvt. Ltd.<br>Director. Sh. Lalit Goyal | 92144-60327 | G-309 | 1518 | Seed processing | 17 | 9 |
| 11. | M/s. Shree Ram Seeds Pvt. Ltd.<br>Director. Sh. Lalit Goyal | 93528-01482 | G-309(A),<br>G-309(B) | 1000 | Seed processing | 60 | 25 |
| 12. | M/s. S.M. Industries<br>Partner Sh. Ratan Chander | 94140-93225 | G-310,311<br>G-316, 317 | 6090 | Mustard Oil &<br>Cake | 50 | 20 |
| 13. | M/s. Khandelia Udyog Pvt. Ltd.<br>Director Sh. S.P. Bahal | 0154-2494104 | G-312 | 1786 | Mustard Oil &<br>Cake | 26 | 5 |
| 14. | M/s. Subhbhagan Farm in<br>Pro. Sh. Pushpa Devi | 94145-80849 | G-314 (Corner) | 1721 | Cattle Feed | 26 | 5 |
| 15. | M/s. Shree Balaji Agro Food<br>Pro. Sh. Mahender Kumar | 94143-44168 | G-315 | 1747 | Kinoow waxing &<br>grading | 70 | 10 |
| 16. | M/s. Ifsa Seeds<br>Pro. Sh. Sukhamander | 94140-91929 | G-318 | 1588 | Seed processing | 26 | 11 |
| 17. | M/s. Chawla Flour Mill<br>Pro. Smt. Darishana Chawla | 99280-09902 | H-318 (A) corner | 528 | Flour & Gram Flour | 10 | 5 |
| 18. | M/s. Shree Ram Seeds Pvt. Ltd.,<br>Director Sh. Lalit Goyal | 0154-244438 | H1-318 (B) (C) | 1000 | Seed processing | 60 | 15 |
| 19. | M/s. Nature Land Organic Foods Pvt. Ltd.<br>Director Sh. Ajit Godara | 94133-77711 | D-325 | 4430 | Grain grading | 61 | 26 |
| 20. | M/s. Nature Land Organic Foods Pvt. Ltd.<br>Director Sh. Ajit Godara | 94133-77711 | D-326 | 6929 | Grain grading | 57.85 | 11 |
| 21. | M/s. Rajasthan State Ganganagar Sugar<br>Mill Ltd.<br>Pro. Sh. | 94610-5221 | D-327 (Corner) | 6807 | Desi Liquor | 100 | 40 |
| 22. | M/s. G.R.G. Home Developers Pvt. Ltd.<br>Director Sh. Satish Goyal | 94140-90347 | D-328 | 6808 | Grain Grading | 66 | 10 |

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|---|---|---|---|---|---|---|---|
| 23. | M/s. H.H. Bottling Plant<br>Pro. Sh. Hemant Gupta | 0154-3098066 | G1-330, G1-330 (A),<br>G1-330 (B) | 3000 | IMFL & country liquior | 98.46 | 40 |
| 24. | M/s. Aditya Foods | 93139-92039 | F-331 | 1474 | Grain Grading | 52 | 3 |
| 25. | M/s. Pehoo Oil Mills<br>Pro. Sh. Manish Aggarwal | 98111-12304 | F-332 | 1474 | Grain Grading | 15 | 3 |
| 26. | M/s. H.K. Kinoo Waxing & Grading<br>Pro. Sh. | | F-333 | 1475 | Kinoow waxing & grading | 90 | 30 |
| 27. | M/s. M.G. Agro Food Industries<br>Pro. Sh. Jawahar Lal Gera | 0154-2460355 | F-334 | 1474 | Kinoow waxing & grading | 50 | 50 |
| 28. | M/s. J.D. Aneja Pvt. Ltd.<br>Pro. Sh. Naresh Aneja | 94140-93388 | E-335, E-336 | 12120 | Oil & Cake | 50 | 10 |
| 29. | M/s. Raj Product<br>Pro. Sh. Akash | 94145-0162 | G1-337 | 1000 | Sarbat | 15 | 5 |
| 30. | M/s. Shiv Ayurvadic Pharmacy<br>Pro. Sh. Pawan Kumar Soni | 98112-76931 | G1-337 (A) | 936 | Allovera products | 10 | 10 |
| 31. | M/s. Bhagwati Agro Flour Mill<br>Pro. Sh. Shayam Sunder | 84143-18264 | G1-337 (B) | 938 | Atta | 15 | 9 |
| 32. | M/s. Rajfed<br>Pro. Sh. | 0154-2640783 | E-338, 339, 340 | 14621 | Warehouse | - | 10 |
| 33. | M/s. Kanda Ediable Oil Pvt. Ltd.<br>Director Sh. Jyoti Kanda | 94140-94165 | E-341 | 4416 | Cotton Seeds Oil & Cake | 100 | 20 |
| 34. | M/s. Nafed<br>Pro. Sh. Bal Kishan Yadav | 0154-2472416 | C-370 | 10000 | Warehouse | 100 | 10 |
| 35. | M/s. Sh. G.R.G. Oil Mills<br>Pro. Sh. Satish | 0154-2441406 | C-371, C-372,<br>C-373, C-374, | 21000 | Mustard Oil | 50 | 25 |
| 36. | M/s. Khandelia Udyog Pvt. Ltd.<br>Director. Sh. Bahal | 99501-78811 | C-375 | 6480 | Mustard Oil & Cake | 100 | 10 |
| 37. | M/s. Mohan Industries Pvt. Ltd<br>Director Sh. Naresh Middha | 0154-2494526 | C-376<br>C-376 (A) | 8120 | Tin Containers | 100 | 15 |
| 38. | M/s. Tayal Industries.<br>Pro. Sh. Ram Niwas Gupta | 94601-02889 | H1-383 | 500 | Papad & Badi | 10 | 5 |
| 39. | M/s. Janki Food Product | 0154-2494983 | H-384 & H-385 | 1000 | Tutte Fruity Soas, Cherry Jam Jelly | 10 | 5 |

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|---|---|---|---|---|---|---|---|
| 40. | M/s. Goswami Ice Industries<br>Pro. Sh. Mahaveer Prasad | 94140-90199 | H1-386 | 500 | Ice | 10 | 5 |
| 41. | M/s. Goswami Ice Industries<br>Pro. Sh. Mahaveer Prasad | 94140-90199 | H1-387 | 500 | Ice | 29.47 | 15 |
| 42. | M/s. Jain Seeds<br>Pro. Sh. Mukesh Jain | 98112-39065 | H1-388 | 500 | Flour Mill | 29.47 | 10 |
| 43. | M/s. K. S Chilling Centre<br>Pro. Sh. Kanuj Kumar | 94144-82435 | H1-389 | 500 | Ice | 10 | 5 |
| 44. | M/s. M.D.R. Foods & Beverage<br>Partner Smt. Madhu Sharma | 94145-13260 | H1-390 & H1-391 | 1000 | Mineral Water | 26.65 | 5 |
| 45. | M/s. Ujjawal Polymers<br>Pro. Smt. Sugndha. Rati | 98181-22270 | H1-392 | 470 | Bottles | 10 | 8 |
| 46. | M/s. Ganpati Centers<br>Pro. Sh. Sulbh Rati | | H1-393 | 500 | Containers | 10 | 5 |
| 47. | M/s. Ganpati Food Provision<br>Pro. Smt. Ranu Aggarwal | 92125-99910 | H1-394 | 500 | Sugar Candy | 10 | 4 |
| 48. | M/s. Sharma Enterprises<br>Partners sh. Naman Arora | 97833-66527 | H1-395 | 500 | Cream & Ghee | 10 | 3 |
| 49. | M/s. Neel Kanth Ind.<br>Pro. Sh. Anil Kumar | | H1-396 | 500 | Mineral Water | 50 | 8 |
| 50. | M/s. N.B. Agro Foods<br>Pro. Sh. Banshidhar | 94140-93747 | G1-397 | 931 | Grain Grading | 28.33 | 5 |
| 51. | M/s. Nyati Industries<br>Pro. Sh. Nyati Dixit | | G1-398 | 931 | Chips & Bhujia | 15 | 4 |
| 52. | M/s. Shiv Shaki Udyog<br>Pro. Sh. Bhagat Goyal | 09216242734 | G1-399 | 931 | Cotton Seed | 22 | 3 |
| 53. | M/s. Balaji Agri Trade Pvt. Ltd.<br>Director Sh.Manoj Kumar Gupta | | G1-400 | 930 | Grain Grading | 49 | 10 |

*Source: Rajasthan State Industrial Development & Investment Corporation Ltd. (RIICO)*

Regional manager
RIICO Ltd., Sriganganagar

*Attachment 2.6.3*

*List of Units at Jodhpur Agro Food Park*

# Attachment 2.6.3: List of Units at Jhodpur Agro Food Park (original)

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## *Agro Food Park, Boranada (Jodhpur)*

**List of Units functioning, products mfg. and investment made in each of them**

| S.N | Name of Party | Plot No. | Present Status | Product | Approximate Investment ( In Lacs) |
|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 |
| 1 | M/s. Shree Goipram Goyal Ware House Pvt. Ltd. | E-8-9, & G-234 to 36 | Production | Guar Gum Powder | 750 |
| 2 | M/s Shree Ram Udyog | E1-10C,E1-11 | Production | Guar Gum Powder | 220 |
| 3 | M/s K.C. Industries | E1-12 & 13 | Production | Guar Gum Powder & Korma | 225 |
| 4 | M/s M.M. Industries | E1-14 | Production | Guar Gum Powder | 150 |
| 5 | M/s M.M. Enterprieses | E1-15 | Production | Guar Gum Powder | 125 |
| 6 | M/s Shree Ram Collides | E1-16,17 | Production | Guar Gum Powder | 300 |
| 7 | M/s Shree Ram Enterprises, | E1-18 | Production | Guar Gum Powder, Split | 150 |
| 8 | M/s Shree Ram Agro Products | E1-19 | Production | All kind of pulses | 125 |
| 9 | M/s Shree Agro Industries, | E1-20 | Production | Guar Gum Split & Powder | 180 |
| 10 | M/s Durve Food Products, | G1-21 | Production | Mfg. of Namken | 25 |
| 11 | M/s Shree Ram Food Products | G1-22 | Production | Guar Gum Churi & Korma | 60 |
| 12 | M/s Satyam Enterprises, | G1-23,24 | Production | Guar Gum Churi & Korma | 700 |
| 13 | M/s D.J.Industries | G1-25 | Production | Guar Gum Churi & Korma | 50 |
| 14 | M/s Shankar Ind. | G1-26 | Production | Decoting Ground Nut | 30 |
| 15 | M/s Balaji Agro Industries, | G1-27-28 | Production | Decoting & Grinding Ground Nut, | 30 |
| 16 | M/s Bhawani Agro Industies, | G1-29 | Production | Decoting Ground Nut seed | 25 |
| 17 | M/s Ramdeo Agro Products | G1-29A | Production | Guar Gum Split & Powder | 120 |
| 18 | M/s Mahesh Industries, | F-30 | Production | Guar Gum Powder | 150 |
| 19 | M/s Dhoot Industries, | F-31 | Production | Guar Gum Powder | 150 |
| 20 | M/s Anish Enterprises, | F-32-33 | Production | Grinding & Sortin gof Grains, Guar Gum & Powder | 70 |
| 21 | M/s Manish Agro Industries, | F-34 | Production | Guar Gum Powder | 125 |
| 22 | M/s Rajasthan Gum Pvt. Ltd., | F-35, 36,37 | Production | Cleaning of Grain and Gwar Gum | 500 |
| 23 | M/s Adeshwar Agro Tech (P) Ltd., | G-38 | Production | Cattle Feeds | 35 |
| 24 | M/s Haresh Oversease Pvt. Ltd., | G-39 to 41, G1-57 to 60 | Production | Guar Gum Powder | 700 |
| 25 | M/s Madhu Agro Spacialities, | G-42 | Production | Spices & Grinding , | 30 |
| 26 | M/s Arihant Agro Indutries, | G1-43 | Production | Spices/ Process of Sonamukhi | 25 |
| 27 | M/s Mahaveer Harble Industries, | G-44 | Production | Herble product | 25 |
| 28 | M/s Mahendra Herble Ind., | G-45 | Production | Sona Mukhi Grinding | 35 |
| 29 | M/s Vishnu Udyog | G-47 | Production | Cleaning of Wheat | 45 |
| 30 | M/s Laxmi Suraj Indutries, | G-48 | Production | Grinding spices & patato chips | 40 |
| 31 | M/s Jagshanti Food | G-49 | Production | Mfg. of Vegitable Chips & Wafers ( Patote) | 50 |
| 32 | M/s Raj Tech Agro Plantation Pvt. Ltd., | G-49A | Production | Ware House | 80 |
| 33 | M/s Mahalaxmi Food Products, | G1-50 | Production | Masala & Food Products | 35 |
| 34 | M/s Vinayak Enterprises, | G-51 | Production | Shorting of Grain & Gum | 50 |
| 35 | M/s Nutrisious Agro Foods, | G-52 | Production | Guar Gum Powder | 115 |
| 36 | M/s Mutha & Birla Enterprises | G1-53, 54 | Production | Grinding of Spices | 50 |
| 37 | M/s Krishna confectonery, | G1-55 | Production | Confectionery Items, | 35 |

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|---|---|---|---|---|---|
| 38 | M/s Marwar Food Products | G-62 | Production | Spices & Grinding, | 45 |
| 39 | M/s Tulsi Food Products | G-63 | Production | Grinding & Spices, | 40 |
| 40 | M/s J.D.Industries | G-64 | Production | Guar Gum Korma Churi | 70 |
| 41 | M/s Jainson Corporation INC | G-65 | Production | Guar Gum Powder by grinder | 210 |
| 42 | M/s Jainson Agro Chem Industries | G-66 to 68 | Production | Guar Gum Split | 175 |
| 43 | M/s Mahadev Agro Industries | G1-69 | Production | Grinding & Processing of spices | 65 |
| 44 | M/s Shiv Shankar Food | G1-70 | Production | Grinding & Processing of spices | 50 |
| 45 | M/s M.P. Agro Industries | G1-71 | Production | Grinding & Processing of spices | 45 |
| 46 | M/s Marwar Food Products | G-72 | Production | Grinding & Processing of spices | 25 |
| 47 | M/s Muskaan Agro Ind. | G-73 | Production | Grinding & Processing of spices | 25 |
| 48 | M/s Monika Enterprises | G-74 | Production | Grinding & Processing of spices | 25 |
| 49 | M/s Amar Agro Foods | G1-75 | Production | Grain Grinding | 35 |
| 50 | M/s Rajeshwari Agro Enterprises | G1-76 | Production | Mfg. Guargum Powder | 120 |
| 51 | M/s Nirmal Enterprises | G1-77 | Production | Dry Vegetables | 40 |
| 52 | M/s Radha Industries | H1-78 | Production | Cattle Feed, Edible Oil, spices | 40 |
| 53 | M/s Shankar Food Product | H1-79 | Production | Toffee Work | 25 |
| 54 | M/s Khetswar Essential Oil Udyog | H1-80 | Production | Essential Oil | 25 |
| 55 | M/s Gangur Food Herbs | H1-81 | Production | Mehandi Powder Papad Badi | 25 |
| 56 | M/s Arvind Food Industries | H1-82 | Production | Grinding of spcies | 15 |
| 57 | M/s P.G.Food Produts | H-83 | Production | Grinding of Spices | 25 |
| 58 | M/s Baan Mata Agro Indutries | H1-85 | Production | Gralic Powder | 25 |
| 59 | M/s Neha Food Products | H1-86 | Production | Custured Powder | 25 |
| 60 | M/s Adeshwar Industries | H1-87 | Production | Spices Grinding | 35 |
| 61 | M/s Deepsikha International | H-88 | Production | Spices & Grinding , | 40 |
| 62 | M/s Sita Sales.Corporation | H-89 | Production | Processing of Aam Papar | 30 |
| 63 | M/s B.L.K. Laboritries | H-90 | Production | Confectionery Items, | 35 |
| 64 | M/s Meera Foods | H-91 | Production | Fruit Pulp, | 35 |
| 65 | M/s Meera Herbs Pvt. Ltd. | H-92 | Production | Ayurvedic Confectiony, | 25 |
| 66 | M/s Sardar Spices | H-93 | Production | Grinding of Spices, | 35 |
| 67 | M/s Lakhan Industries, | H-94 | Production | Grinding of Spices, | 35 |
| 68 | M/s Gogar Industries | H-95 | Production | Cleaning ofGrains | 20 |
| 69 | M/s Jansons India Industries | H-96 | Production | Guar Gum Powder | 45 |
| 70 | M/s Ramesh Indsutries | H-97 | Production | Grinding of grain & Spices, | 35 |
| 71 | M/s K.D. Food Products | G1-98 | Production | Namkeen & Roasted Namkeen | 35 |
| 72 | M/s Paras Food Products | G1-99 | Production | Besan & Aatta | 45 |
| 73 | M/s Pawan Putra Food Products | G1-100 | Production | Namkin | 35 |
| 74 | M/s J.K.Food Products | G1-101 | Production | Toffee | 25 |
| 75 | M/s Rishab Enterprises | G1-102 | Production | Dhania & Grinding of Spices | 25 |
| 76 | M/s Archna Agro Tech | G1-103 | Production | Grinding of spices | 25 |
| 77 | M/s Madhukar Agro Industries | G1-104 | Production | Grinding of pulser | 35 |
| 78 | M/s Shreya Industries | G1-105 | Production | Supari Mfg | 25 |
| 79 | M/s Suncity Agro Food Industries | G1-106 | Production | Masroom process products | 35 |

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|---|---|---|---|---|---|
| 80 | M/s Hitesh Industries | G1-107 | Production | Guar Gum Churi Korma | 40 |
| 81 | M/s Vadera International | G1-108 | Production | Paking of Tea | 20 |
| 82 | M/s Natik Agro Industries | G-110 | Production | Mfg. Cleaing , Grinding and Processing of spices & food grains | 50 |
| 83 | M/s Shyam Industries | G-111 | Production | Mfg. of spices | 35 |
| 84 | M/s Bhawani Industries | G-112 | Production | Mfg. Guar Gum & spilt Churi | 125 |
| 85 | M/s Bharat Sheed Company | G-113-114 | Production | Seeds Prorcessing works | 70 |
| 86 | M/s Pankaj Conficetionery | G-115 to 117 | Production | All type of confectionery Items | 70 |
| 87 | M/s Shri Impex | G-118-119 | Production | Guar Gum Spilt processing of grains | 70 |
| 88 | M/s Arihant Industries | G1-120 | Production | Grading & Grinding of all kinds of Grain & Spices | 70 |
| 89 | M/s Ganpati Udyog | G1-121 | Production | Confectionery Items, | 50 |
| 90 | M/s Tanot Rai Agro Industries | G1-122 | Production | Detlydration of vegitables, Fruits, Onion, Flakes Garlic, Etc., | 50 |
| 91 | M/s Tanot Rai Agro Industries | G1-123 | Production | Detlydration of vegitables, Fruits, Onion, Flakes Garlic, Etc. | 35 |
| 92 | M/s L.D. Agro Industries | G1-124 | Production | Cleaing of Grain Grinding | 50 |
| 93 | M/s Arihant Agro Industries | G1-125 | Production | Mfg of spices, Grinding & Grading of Grain & spices | 45 |
| 94 | M/s Madhu Agro Industries | G1-126 | Production | Mfg. of Grinding & Grading of Grain & spices | 55 |
| 95 | M/s Madhu Agro Industries | G1-127 | Production | Mfg. of Grinding & Grading of Grain & spices | 65 |
| 96 | M/s Jai Laxmi Agro Tech | G1-128 | Production | Processing of cleaing of garlic | 75 |
| 97 | M/s Jagdamba Agro Industries | G1-129 | Production | Grinding & Processing of spices | 50 |
| 98 | M/s Jagdamba Agro Industries | G1-130 | Production | Grinding & Processing of spices | 35 |
| 99 | M/s Shiv Shakti Rollor Flour Mills | G1-131 | Production | Maida Suji, Ata Bran | 40 |
| 100 | M/s Suman Enterprises | G1-132 | Production | Processing of Grain | 40 |
| 101 | M/s J.P. Industries | G-133 | Production | Cleaing of Grain | 55 |
| 102 | M/s Mahesh Enterprises | G-134 | Production | Grinding of grain | 65 |
| 103 | M/s Niku Sortex | G-135 | Production | Griding & Shorting of spices | 60 |
| 104 | M/s J.P. Industries | G-136 | Production | Processing of Teera & Grain | 50 |
| 105 | M/s Sagar Industries | G-137 | Production | Grinding of spices | 55 |
| 106 | M/s Dig Internation | G-138 | Production | Grinding of spices | 55 |
| 107 | M/s Dig Internation | G-139 | Production | Grinding of Grain | 60 |
| 108 | M/s Marwar International | G-140 | Production | Grinding of Grain | 60 |
| 109 | M/s Laxmi Sweet Products | G-141 | Production | Grinding of spices & Grain | 65 |
| 110 | M/s Subbam Eddible Pvt. Ltd., | F-142 to 145 | Production | Besan Dal | 200 |
| 111 | M/s Dinesh Agro | F-146 | Production | Gradin of Wheat | 70 |
| 112 | M/s Navkar Industries | F-147 | Production | Mfg. of Guar Gum Churi & Korma | 125 |
| 113 | M/s Shree Nath Industries | F-148 | Production | Mfg. of Guar Gum Churi & Korma | 125 |
| 114 | M/s Hariesh Industies | F-149 | Production | Cattle Feed | 80 |
| 115 | M/s Dindayal Colloids Pvt. Ltd., | F-150 to 153 | Production | Mfg. of Guar Gum | 350 |

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|---|---|---|---|---|---|
| 116 | M/s R.K.Indutries | E-154 | Production | Wheat Grinding | 70 |
| 117 | M/s Gulecha Industies | E-154A | Production | Grainding of Grain & Oil | 70 |
| 118 | M/s Anil Industries | E-155 | Production | Mfg. of Grinding of spcies | 75 |
| 119 | M/s Malu Industries | E-155A | Production | Grinding of spcies | 65 |
| 120 | M/s Mutha Enterprises | E-156 | Production | Guar Gum Powder | 125 |
| 121 | M/s Daga Enterprises | E-157 | Production | Guar Gum Claining | 60 |
| 122 | M/s P.C. Industies | E-157A | Production | Claning Grain of Wheat | 55 |
| 123 | M/s Hira Internationl | F-159 | Production | Mfg. of salt | 45 |
| 124 | M/s Shanti Agro & Food Products | F-160 | Production | Griding of wheat | 45 |
| 125 | M/s Maheshwari Spices & Food Products | F-161-162 | Production | Grinding of spcies | 45 |
| 126 | M/s Vijay Indutries | F-163-164 | Production | Grain & spices | 50 |
| 127 | M/s Navkar Enterprises | F-166 | Production | Cleaning of Guar Gum | 80 |
| 128 | M/s Navkar Enterprises | E-167 | Production | Cleaing of Guar Gum | 90 |
| 129 | M/s Jagdish Industries | F-168 | Production | Grinding of spcies | 45 |
| 130 | M/s Anjana Industries | F-169 | Production | Mong Dall | 45 |
| 131 | M/s Raja Ram Industries | F-170 | Production | Graind of spices & Grain | 45 |
| 132 | M/s Ram Agro Foods Ind. | F-171 | Production | Guar Gum Processing | 55 |
| 133 | M/s Sunil Agro Industries | F-172 | Production | Mfg. of Grinding & spices & split | 75 |
| 134 | M/s Mohan Industries | F-173 | Production | Grinding of Spices | 70 |
| 135 | M/s Vijay Deep Ind. | F-174 | Production | Grain Cleaning | 65 |
| 136 | M/s Balaji Industies | F-175 | Production | Cleaing of Dhania | 50 |
| 137 | M/s Om Agro Products | F-176 | Production | Mfg. of Guar Gum Powder | 95 |
| 138 | M/s Krishna Industries | F-177 | Production | Atta | 35 |
| 139 | M/s Raj Industries | F-178 | Production | Cleaning of powder grain | 55 |
| 140 | M/s Maheshwar Impex | F-179 | Production | Edile & Non Edible Oil | 65 |
| 141 | M/s V.G. Products | E-180-181 | Production | Grain Griding | 55 |
| 142 | M/s Sancheti International | E-183 | Production | Mfg of Mouthfresherners Sweat Supari | 75 |
| 143 | M/s Gitika Enterprises | E-185 | Production | Cleaning & grinding plant | 80 |
| 144 | M/s Raj Polymers & Chemcial | E-188-189 | Production | Guar Gum Powder | 300 |
| 145 | M/s Satyam Enterprises, | D-190-191 | Production | Guar Gum split powder churi korma | 300 |
| 146 | M/s Vijay Food Products | D-192-193 | Production | Guar Gum Grinding | 250 |
| 147 | M/s Chopra Streep Limitited | D-194-195 | Production | Guar Gum Split & Powder | 275 |
| 148 | M/s Rajasthan Gum Pvt. Ltd., | D-196 | Production | Guar Gum Split & Powder & cleaning of grain | 135 |
| 149 | M/s Soni Industries | G-197-198 | Production | Guar gum | 155 |
| 150 | M/s Pooja Agro | G1-199 | Production | Processing & grinding of spices | 140 |
| 151 | M/s Ramdeo Agro Ind. | G1-199A | Production | Atta daliya & weat | 90 |
| 152 | M/s Agarwal Agro Industries | G1-200A | Production | Wheat Flour | 60 |
| 153 | M/s Laxmi Narayan Gum Pvt. Limitied | G-200 | Production | Guar Gum Powder | 95 |
| 154 | M/s Umma Industries | G1-202 | Production | Cleaing of wheat & grain | 75 |
| 155 | M/s Hari Om Industries | G1-203 | Production | Senna leave | 55 |
| 156 | M/s Parsavnath Agro Industries | G1-206 | Production | Guar Gum | 95 |
| 157 | M/s Kartikey Foods | G1-207-208 | Production | process of spices | 60 |
| 158 | M/s Sheelas Food Products | G1-209A | Production | Guar Gum Split | 75 |
| 159 | M/s H.R.Industries | G1-210-210A | Production | Guar Gum Powder | 150 |
| 160 | M/s Soni Agro Industries | G1-211-212 | Production | Guar Gum Powder | 115 |
| 161 | M/s E.T.S. Agro Pvt. Ltd., | G1-215-216-217 | Production | Guar Gum Powder & Spilt | 250 |
| 162 | M/s Anil Enterprises | G1-220 | Production | Guar Gum Powder | 95 |
| 163 | M/s Nokha Agro Services | F-237,238, 243, 244 | Production | Cleaning of Grain | 200 |

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| | | | | | |
|---|---|---|---|---|---|
| 164 | M/s Rajasthan Gum Pvt. Ltd. | F-239 to 242 | Production | Guar Gum split & Powder | 300 |
| 165 | M/s Uma Laxmi Organic Pvt. Ltd., | F-245 to 249, 255 | Production | Organic Products | 500 |
| 166 | M/s Maehswari Industries | F-250 | Production | Guar Gum | 150 |
| 167 | M/s Pankaj Food Products | F-251 | Production | Processing & Cleaing of Pulses & Grains | 105 |
| 168 | M/s Vishnu Prakash R. Punglia | F-252 | Production | Agro Based Product | 125 |
| 169 | M/s Goyal Industries | F-253 | Production | Guar Gum Powder | 125 |
| 170 | M/s Badal Industries | G1-258 | Production | Guar Gum Split, Cattle Feed | 75 |
| 171 | M/s Durga Agro Food Ind. | G-259 | Production | All Type of spices | 80 |
| 172 | M/s Arishta Enterprise, | G-260 | Production | Cleaning Grading of Food Grains | 150 |
| 173 | M/s Caremoli(India) Pvt. Ltd | E-261-262 | Production | Guar Gum Powder | 500 |
| 174 | M/s Kapil Agro Industries | E-264-265 | Production | Agro Based Product | 350 |
| 175 | M/s Raj Ganga Agro Products | E1-268-269 | Production | Cattle Feeds | 190 |
| 176 | M/s Sunita Hydrocoiloides Pvt. Ltd., | F-282-288 | Production | Guar Gum Powder | 5500 |
| 177 | M/s Maa Vakal Refineries Pvt. Ltd. | F-289-290 | Production | Edible Oil & Refind | 170 |
| 178 | M/s Naman Enterprises, | F-291 | Production | Mfg of Guar Gum Powder | 105 |
| 179 | M/s Naman Agroils Pvt. Ltd | F-292 | Production | Edible Oil & Non Edible Oil | 95 |
| 180 | M/s Subham Industries | F-296 | Production | Guar Gum Churi | 50 |
| 181 | M/s Abhishek Industries | F-297 | Production | Guar Gum Powder | 75 |
| 182 | M/s Kasat Udyog | F-300 | Production | Guar Gum Powder | 50 |
| 183 | M/s Suncity Gum International | E1-278 | Production | Mfg. of Guar Gum Powder | 150 |
| 184 | M/s Rajasthan Gum Pvt Ltd. | SP-6 | Production | Mfg. of Guar Gum Powder | 3800 |
| | | | | **Total** | **27455** |

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## Agro Food Park, Boranada (Jodhpur)

List of Units under construction , products to be mfg. and proposed investment to be made in each of them

| S.N | Name of Party | Plot No. | Present Status | Product | Approx. Proposed Investment (Rs in Lacs) |
|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 |
| 1 | M/s Vikas Graineries Ltd., | E-1, 2, G-222 to 225 | Construction | Guar Gum Product | 1200 |
| 2 | M/s. Continent Inmpex Pvt. Ltd. | E-3-4 & G-226 to 28 | Construction | Guar Gum | 1000 |
| 3 | M/s Shri Ganesh Agro Food Industries, | G-46 | Construction | Agro Based Product | 50 |
| 4 | M/s Mamta Lohiya | G1-56 | Construction | Grinding of spices | 70 |
| 5 | M/s A.D. Enterprises | E-182 | Construction | Grinding of spices | 75 |
| 6 | M/s Jodhpur Agro Food Pvt. Ltd. | E-184 | Construction | Supari | 75 |
| 7 | M/s Mahehswar Agro Food Ind. | E-186 | Construction | Guar Gum Powder | 150 |
| 8 | M/s Rahul Agro Industries | E-187 | Construction | Guar Gum Split & Powder | 350 |
| 9 | M/s Maa Kripa Agro Products | G1-213-214 | Construction | Guar Gum | 220 |
| 10 | M/s Shree Ram Hydrocollads | E1-266-267 | Construction | Guar Gum Powder | 700 |
| 11 | M/s Shree Nath Agro Industries | E-270-271 | Construction | Cattle Feed Grading Cleaning | 175 |
| 12 | M/s Vijay Laxmi Internationl | E-272-273 | Construction | Guar Gum Powder | 450 |
| 13 | M/s. Surendra Bhandari | E-6-7, G-231 to 23 | Construction | Guar Gum Split & Powder | 1000 |
| 14 | M/s Rifat Food Corporation | E-153A | Construction | Tomato Sauces | 70 |
| 15 | M/s Caremoli(India) Pvt. Ltd | E-263 | Construction | Guar Gum | 2000 |
| 16 | M/s Sambhav Agro Industries | F-295 | Construction | Guar Gum Powder | 250 |
| 17 | M/s Shri Ram Natural Polymers Pvt. Ltd., | G1-218-219, 219A | Construction | Guar Gum Powder & Spilt | 550 |
| 18 | M/s Nutrix India Pvt. Ltd., | E1-274 to 277, 280, 281 | Construction | Masala | 1500 |
| 19 | M/s Balaji Udyog | G1-71A | Vacant | Grinding & Processing of spices | 50 |
| 20 | M/s J.S.International | G1-109 | Vacant | Guar Gum Churi & Korma | 50 |

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| | | | | | |
|---|---|---|---|---|---|
| 1 | M/s R.G.Foods | F-165 | Vacant | Grinding of wheat | 60 |
| 22 | M/s Anand Agro | G1-201 | Vacant | Grinding & grading of spcies & grain | 25 |
| 23 | M/s Sheha Confectionery | G1-221 | Vacant | Confectionery | 30 |
| 24 | M/s Santi Paluse | F-254A | Vacant | Pulses | 35 |
| 25 | M/s Tribal Medicinals | G-256-257 | Vacant | Herble Medicians | 150 |
| 26 | M/s Kaushalya Enterprises | F-293 | Vacant | Agro Based Product | 125 |
| 27 | M/s Kansara Foods | F-298, 299 | Vacant | Spices & Food Products | 250 |
| 28 | M/s Maheshwari Gum Industries | F-300A | Vacant | Mfg of Guar Gum Powder | 250 |
| 29 | M/s Quality Foods Products | F-301 | Vacant | Mfg. of Spices | 150 |
| 30 | M/s R.S.Gum & Chemeicals | E1-279 | Vacant | Gum Products | 100 |
| 31 | M/s Koshilya Enterprises | F-294 | Vacant | Agro Based Product | 120 |
| | | | | **Total** | **11280** |

(ANIL KHANDELWAL)
Regional Manager
RIICO Ltd., Boranada

*Source: Rajasthan State Industrial Development & Investment Corporation Ltd. (RIICO)*

*Attachment 2.6.4*
*List of Public Markets*

## District-wise Number of Krishi Upaz Mandies and Name of main Commodity List Arrrivals in Mandi

| | DISTRICT | | KUMS NAME | CLASS | ARRIVALS OF MAJOR CROPS |
|---|---|---|---|---|---|
| 1 | AJMER | 1 | AJMER(GRAIN) | B | Wheat.Maize, Bajra,Gram |
| | | 2 | AJMER(F & V) | C | Onion, Banana, Mango |
| | | 3 | BEAWAR | C | Moong, Jowar, Maize,wool,Gram,Mustard |
| | | 4 | BIJAYNAGAR | B | Moong, Cotton, Urad, Guar, Mustard,gram.Wheat |
| | | 5 | KEKRI | B | Mustard, Moong, Urad, Zeera,Gram, Jowar,Wheat,Shauff |
| | | 6 | MADANGANJ | C | Moong, Zeera, Jowar,Bajra,Gram |
| 2 | JAIPUR | 7 | CHAKSU | C | Mustard, Groundnut, Bajra,Gram |
| | | 8 | CHOMU | SA | Barley, Groundnut, Mustard, Bajra. |
| | | 9 | JAIPUR ( F & V) | SA | Tomato, Onion, Cabage, Pea, Carrot, Colliflower, Chilli,Potato |
| | | 10 | JAIPUR (GRAIN) | SA | Bajra, Groundnut, Wheat, Mustard, Barley.Gram.Chilli |
| | | 11 | KISHANGARH RENWAL | C | Mustard, Bajra, Barley, Guar, Chola,Gram |
| | | 12 | KOTHPUTLI | C | Mustard, Bajra, Barley. |
| 3 | DAUSA | 13 | BANDIKUI | C | Bajra, Mustard,Wheat, Gram |
| | | 14 | DAUSA | B | Bajra, Mustard, Gram, Barley, Wheat |
| | | 15 | LALSOT | B | Groundnut, Mustasrd, Wheat, |
| | | 16 | MAHUA MANDAWAR | C | Mustard, Barja, Wheat |
| | | 17 | MANDAWARY | D | Wheat, Gram, Mustard |
| 4 | SIKAR | 18 | FATEHPUR | C | Bajra, Guar,Chola, Moth. |
| | | 19 | NEEMKATHANA | D | Bajra, Mustard. |
| | | 20 | SIKAR | A | Bajra, Barley, Gram, Mustard, Groundnut, |
| | | 21 | SRIMADHOPUR | A | Bajra,Barley, G.nut, Gram, Mustard |
| 5 | JHUNJHUNU | 22 | CHIRAWA | D | Bajra, Mustard |
| | | 23 | JHUNJHUNU | C | Bajra, Mustard, Barley, Chola. |
| | | 24 | NAWALGARH | C | Bajra, Mustard, Barley. |
| | | 25 | SURAJGARH | D | Bajra, Barley, Mustard |
| 6 | ALWAR | 26 | ALWAR | SA | Mustard, Wheat, Gram, Bajra, Arhar, Barley, |
| | | 27 | KHAIRTHAL | SA | Mustard, Wheat, Guar, Bajra, Barley.cotton |
| | | 28 | KHERLI | A | Mustard, Wheat, Bajra, Barley |
| | | 29 | BARODAMEV | C | Mustard, Wheat, Bajra |
| 7 | BHARATPUR | 30 | BAYANA | B | Mustard, Wheat, Bajra, Guar |
| | | 31 | BHARATPUR | SA | Mustard, Wheat, Bajra |
| | | 32 | DEEG | C | Mustard, Wheat, Bajra |
| | | 33 | KAMA | C | Mustard, Wheat, Bajra |
| | | 34 | NADWAI | C | Mustard, Wheat, Bajra |
| | | 35 | NAGAR | B | Mustard, Wheat, Bajra |
| 8 | DHOLPUR | 36 | DHOLPUR | B | Mustard, Bajra, Ghee |
| 9 | SAWAI MADHOPUR | 37 | GANGAPUR CITY | A | Mustard, Wheat, Gram, Bajra, Til |
| | | 38 | S.MADHOPUR | A | Mustard, Wheat, Gram, Bajra, ,Guava |
| 10 | KARAULI | 39 | HINDOUN | B | Wheat, Bajra, Mustard,Gram |
| 11 | BIKANER | 40 | BIKANER (FV ) | A | Onion, Tometo, Kachari |
| | | 41 | BIKANER (GRAIN) | SA | Groundnut, Gram, Guar, Moth, wheat,Mustard |
| | | 42 | KHAJUWALA | C | Mustard, Guar, Gram,Wheat |
| | | 43 | LUNAKARNSAR | C | Guar, Moth,Groundnut |
| | | 44 | NOKHA | B | Moth, Gram, Guar,Groundnut |
| | | 45 | SRI DUNGARGARH | D | Gram, Groundnut |

## District-wise Number of Krishi Upaz Mandies and Name of main Commodity List Arrrivals in Mandi

| | DISTRICT | | KUMS NAME | CLASS | ARRIVALS OF MAJOR CROPS |
|---|---|---|---|---|---|
| 12 | CHURU | 46 | CHURU | D | Bajra, Chola |
| | | 47 | RATANGARH | C | Barley, Moth, Guar |
| | | 48 | SADULPUR | C | Bajra, Guar, Gram, Moth |
| | | 49 | SARDAR SHAHAR | D | Moth, Guar, Groundnut |
| | | 50 | SUJANGARH | C | Gram, Moth, Bajra,Groundnut |
| 13 | SRIGANGANAGA | 51 | SADUL SHAHAR | A | Wheat, Mustard, Cotton, Guar, Barley |
| | | 52 | SURATGARH | B | Wheat, Mustard, Cotton, Guar, Barley |
| | | 53 | ANOOPGARH | A | Wheat, Mustard, Cotton, Gram, Guar |
| | | 54 | GAJSINGHPUR | B | Wheat, Mustard, Cotton, Gram, Guar. |
| | | 55 | GHARSANA | B | Wheat, Mustard, Cotton, Gram, Guar. |
| | | 56 | JAITSAR | C | Wheat, Mustard, Cotton, Guar. |
| | | 57 | KESRISINGHPUR | C | Wheat, Mustard, Cotton, Barley, Guar. |
| | | 58 | PADAMPUR | A | Wheat, Mustard, Cotton, Barley, Guar. |
| | | 59 | RAISINGHNAGAR | A | Wheat, Mustard, Cotton, Gram, Guar. |
| | | 60 | RAWLA | C | Wheat, Mustard, Cotton, Guar. |
| | | 61 | RIDHMALSAR | D | Wheat, Mustard, Cotton, Guar. |
| | | 62 | SRIGANGANAGAR(GR.) | SA | Wheat, Mustard, Cotton, Gram, Guar, |
| | | 63 | SRIGANGANAGAR(F&V) | B | Kinnu,Wood,Carrot,etc |
| | | 64 | SRI KARANPUR | B | Wheat, Mustard, Cotton, Gram, Guar. |
| | | 65 | SRIVIJAYNAGAR | A | Wheat, Mustard, Cotton, Gram, Guar. |
| 14 | HANUMANGARH | 66 | BHADRA | D | Wheat, , Guar |
| | | 67 | GOLUWALA | B | Mustard, Wheat, Barley, Cotton, Guar, Gram |
| | | 68 | HANUMANGARH | SA | Paddy, Mustard, Wheat, Cotton, Guar, Arandi, |
| | | 69 | NOHAR | C | Guar, Moth,Mustard, Wheat, Gram,Arandi,Groundnut |
| | | 70 | PILIBANGA | A | Mustard, Wheat, Cotton, Paddy, Guar |
| | | 71 | RAWATSAR | A | Wheat, Mustard, Cotton, Guar |
| | | 72 | SANGRIA | A | Wheat, Mustard, Cotton, Guar |
| 15 | JODHPUR | 73 | BILARA | D | Cotton,Mustard, Bajra. |
| | | 74 | JODHPUR(GRAIN) | SA | Bajra, Moong, Mustard, Zeera, Guar, Chilli,Groundnut |
| | | 75 | JODHPUR(F&V) | A | Onion, Kachri,Potato |
| | | 76 | PIPAR CITY | D | Bajra, Chilli, Moth,Cotton . |
| | | 77 | PHALODI | D | Mustard, Cumin,Groundnut,Arandi |
| 16 | JAISALMER | 78 | JAISALMER | C | Groundnut ,Gram,Guar,Mustard, , Isabgole |
| 17 | JALORE | 79 | BHINMAAL | C | Mustard, Zeera,Moong |
| | | 80 | JALORE | D | Mustard, Zeera, Wheat |
| | | 81 | SANCHOR | D | Mustard, Zeera,Bajra |
| | | 82 | RANIWARA | D | Mustard, Zeera,moong |
| 18 | BARMER | 83 | BALOTRA | D | Guar, Bajra, Moong,Moth. |
| | | 84 | BARMER | A | Bajra,, Moth, Zeera, Guar,Moong |
| 19 | NAGAUR | 85 | DEEDWANA | C | Bajra, Moth |
| | | 86 | DEGANA | C | Bajra, Guar, Moth, Moong. |
| | | 87 | KUCHAMAN CITY | C | Bajra, Moong, Mustard, Onion. |
| | | 88 | MERTA CITY | A | Mustard, Moong, Zeera,Gram, isbgole |
| | | 89 | NAGAUR | A | Mustard, Moong, Zeera, Guar, Moth, Isabgole. |
| 20 | PALI | 90 | JAITARAN | D | Moong, Guar,Jeera |
| | | 91 | PALI | C | Mustard, Moong,Wheat |
| | | 92 | RANI | D | Mustard, Guar,Gram,Moong |
| | | 93 | SOJAT ROAD | A | Mehandi, Guar, Mustard.sonamukhi |
| | | 94 | SUMERPUR | A | Mustard, Moong, Gram, Cotton, Guar, Arandi, |
| 21 | SIROHI | 95 | ABU ROAD | D | Arandi, Mustard, Tomato, Wheat |
| 22 | KOTA | 96 | ITAWA | A | Wheat, Mustard, Soyabeen, Dhaniya. |
| | | 97 | KOTA | SA | Wheat, Mustard, Soyabeen, Dhaniya, Paddy, Gram,Til,Urad |
| | | 98 | KOTA (F&v) | A | potato,orange,Garlic,etc |
| | | 99 | RAMGANJ MANDI | SA | Wheat, Mustard, Soyabeen,Urad, Dhaniya. |
| 23 | BARAN | 100 | ATRU | C | Mustard, Soyabeen, Wheat, Dhaniya,maize. |
| | | 101 | BARAN | SA | Mustard, Soyabeen, Wheat, Dhaniya. |
| | | 102 | Anta | C | Mustard, Soyabeen, Wheat, Dhaniya. |

## District-wise Number of Krishi Upaz Mandies and Name of main Commodity List Arrrivals in Mandi

| | DISTRICT | | KUMS NAME | CLASS | ARRIVALS OF MAJOR CROPS |
|---|---|---|---|---|---|
| | | 103 | CHABRA | A | Mustard, Wheat, Maize, Dhaniya, Soyabeen, Garlic. |
| 24 | BUNDI | 104 | BUNDI | SA | Mustard, Wheat, Paddy, Maize, Soyabeen, Dhaniya,Urad |
| | | 105 | KESHORAI PATAN | C | Mustard, Wheat, Dhaniya,Soyabeen |
| | | 106 | SUMERGANJ | D | Mustard, Wheat. |
| | | 107 | DEIE | C | Mustard, Wheat. |
| 25 | JHALAWAR | 108 | BHAWANI MANDI | SA | Mustard, Wheat, Soyabeen, Orange, Maize, Dhaniya,Masoor |
| | | 109 | IKLERA | C | Mustard, Wheat, Dhaniya |
| | | 110 | CHOUMAHLA | A | Gram, Soyabeen,Mustared |
| | | 111 | JHALRAPATAN | A | Soyabeen, Dhaniya, Mustard, |
| | | 112 | KHANPUR | C | Soyabeen, Dhaniya, Mustard, |
| 26 | TONK | 113 | DEOLI | C | Mustard, Wheat, Barley, Maize,bajra. |
| | | 114 | MALPURA | B | Mustard, bajra, Moong, Gram,Wheat, |
| | | 115 | NIWAI | A | Mustard, Groundnut, Bajra,wheat,Saunf |
| | | 116 | TONK | C | Mustard. Wheat, Bajra, |
| | | 117 | UNIYARA | D | Mustard, Wheat,urad |
| 27 | BANSWARA | 118 | BANSWARA | C | Cotton, Wheat, Maize. |
| 28 | DUNGARPUR | 119 | DUNGARPUR | D | Maize, Gram, Urad, Wheat. |
| 29 | UDAIPUR | 120 | FATEH NAGAR | C | Maize, G.nut, Mustard, Wheat. |
| | | 121 | UDAIPUR | A | Maize, Mustard, Gram, Wheat, Urad. |
| | | 122 | UDAIPUR (F&V) | C | Ratalu, Urabi, Ginger, etc. |
| 30 | BHILWARA | 123 | BHILWARA | A | Maize, Mustard, Jowar,wheat,urad,chilly, Barley |
| | | 124 | GANGAPUR | C | Maize,Jower,cotton |
| | | 125 | MANDAL GARH | D | Maize, Wheat,Mustared |
| | | 126 | BIJOLIA | D | Maize,Soyabean,Wheat |
| 31 | CHITTORGARH | 127 | BARISADRI | D | Wheat, Maize, Soyabeen,Mustared |
| | | 128 | BEGU | D | Wheat, Maize, Soyabeen,Mustared |
| | | 129 | CHITTORGARH | C | Wheat, Maize, Soyabeen |
| | | 130 | KAPASAN | D | Wheat, Mustard, Maize |
| | | 131 | NIMBAHERA | B | Wheat, Maize, Soyabeen, Mustard,Ajwan, |
| 32 | PRATAPGARH | 132 | PRATAPGARH | A | Wheat, Maize,Soyabeen,Masoor,Ajwan, Gram,Mustared |
| 33 | RAJSAMAND | 133 | RAJSAMAND | C | Wheat, Maize, Jowar. |

*Source: Rajasthan Agricultural Statistics at a Glance for the Year 2013-2014 (Commissionerate of Agriculture, Rajasthan, Jaipur (Statistical Cell))*

# *Attachment 2.6.5*
# *General Market Information (Example of Jaipur Market: Fruits & Vegetables)*

# General Market Information
# (Example of Jaipur Market: Fruits & Vegetables)

| | |
|---|---|
| **GENERAL INFORMATION** | |
| Mandi Name : | JAIPUR (FV) |
| Full Postal Address : | JAIPUR |
| City : | Jaipur |
| Email : | - |
| Telephone No. with STD Code : | - |
| Year of establishment : | 1966 |
| Population Served : | 2500 |
| Geographical area served by Market (No. of Villages etc.) : | 250 |
| **ADMINISTRATION** | |
| Regulated/Unregulated : | Regulated |
| Year of Regulation : | 1975 |
| Name of the Market Legislation : | Raj.Agri.Produce Market Act 1961 |
| Whether Elected/Nominated/Superseded APMC : | Elected |
| Name of Chairman/Administrator : | SMT.RUKMA BALA SOYAL |
| Address of Chairman/Administrator : | MANDI KHACIKAN MOHALLA CHAR SAWAZA JAIPUR |
| Telephone No. of Chairman/Administrator : | 9829924049 |
| Name of Secretary : | ASHOK KUMAR GARG |
| Address of Secretary : | SECRETARY KUMS(FV) JAIPUR |
| Telephone No. of Secretary : | 9887322000 |
| Name of Officer-in-Charge of Market Information : | ASHOK KUMAR GARG |
| Address of Officer-in-Charge of Market Information : | SECRETARY KUMS(FV) JAIPUR |
| Telephone No. of Officer-in-Charge of Market Information : | 9887322000 |
| If Unregulated, Name of Owner and Management : | |
| Details of Staff : | |
| Market Holidays : | Sunday |
| Market Hours : | 10 |
| **RAIL/ROAD CONNECTIVITY** | |
| Name of the nearest railway station: | Sanganer |
| Distance of the railway station from the market(in Kms): | 6 |
| Name of the Nearest National /State Highway: | Ajmer Road |
| **MARKET AREA** | |
| Notified area of Market Committee: | |
| Subyard (If any) and It's exact location: | 4 |
| Farthest place in the Hinterland: | Muhana |
| Nearest place in the Hinterland: | Muhana |
| Commodity Wise Processing Units in the Market area: | 3 |
| Number of Cold Storages available: | 4 |
| Capacity of Cold Storages available: | 5000 MT |
| Number of Commodities notified under regulation: | |
| Average daily dispatches to outside markets during the season: | Total |
| Average daily dispatches to outside markets during the peak period: | 60% |
| Names of traditional markets(important) to which produce is sent: | |

| | Supervisory | Administrative |
|---|---|---|
| Permanent | 4 | 58 |
| Temporary | 1 | 2 |

*Source: Department of Agricultural Marketing Website (as of June 2016)*

# *Attachment 2.6.6*
# *Maximum and Minimum Prices of Agricultural Produces in Rajasthan*

# Attachment 2.6.6
# Maximum and Minimum Prices of Agricultural Produce in Rajasthan

| No. | Commodity | Modal Price (Rs./Quintal) | Max. Price (Rs./Quintal) | Min. Price (Rs./Quintal) | Market |
|---|---|---|---|---|---|
| 1 | Raddish | 600 | 600 | 600 | Sri GANGANAGAR (FV) |
| 2 | Pumpkin | 800 | 800 | 800 | Sri GANGANAGAR (FV) |
| 3 | Pumpkin | 800 | 900 | 700 | AJMER (F V) |
| 4 | Onion Green | 800 | 1,000 | 600 | JODHPUR (F V) |
| 5 | sugar beet | 900 | 1,000 | 800 | BIKANER ( F V W) |
| 6 | Saal | 950 | 1,000 | 900 | UDAIPUR (GRAIN) |
| 7 | Kharbuja(Musk Melon) | 1,100 | 1,200 | 800 | AJMER (F V) |
| 8 | Musk Melon | 1,200 | 1,400 | 1,000 | BIKANER ( F V W) |
| 9 | Water Melon | 1,200 | 1,400 | 1,000 | JODHPUR (F V) |
| 10 | Spinach | 1,350 | 1,500 | 1,200 | JALOR |
| 11 | Carrot | 1,500 | 1,500 | 1,500 | Sri GANGANAGAR (FV) |
| 12 | Papaya (Raw) | 1,500 | 1,500 | 1,500 | Sri GANGANAGAR (FV) |
| 13 | Peas(Dry) | 1,500 | 1,500 | 1,500 | Sri GANGANAGAR (FV) |
| 14 | Papaya (Raw) | 1,500 | 1,700 | 1,600 | Kota (F V) |
| 15 | Onion | 1,500 | 2,100 | 900 | M. KISHANGARH |
| 16 | Banana | 1,600 | 1,700 | 1,500 | BIKANER ( F V W) |
| 17 | Banana | 1,600 | 1,800 | 1,400 | CHITTORGARH |
| 18 | POTATO | 1,600 | 1,800 | 1,500 | CHITTORGARH |
| 19 | Mahua | 1,620 | 1,630 | 1,615 | UDAIPUR (GRAIN) |
| 20 | Ratan Joat(Alkanet Root) | 1,740 | 1,750 | 1,730 | UDAIPUR (GRAIN) |
| 21 | Barley | 1,775 | 1,820 | 1,760 | MALPURA |
| 22 | All Flower | 1,800 | 2,000 | 1,500 | JODHPUR (F V) |
| 23 | Gram Raw(Chholia) | 2,000 | 2,500 | 1,500 | JODHPUR (F V) |
| 24 | Mint(Pudina) | 2,200 | 2,400 | 2,000 | BIKANER ( F V W) |
| 25 | Round gourd | 2,200 | 2,500 | 1,800 | CHITTORGARH |
| 26 | Dacha | 2,250 | 2,250 | 2,250 | KAMA |
| 27 | Paddy(Dhan) | 2,300 | 2,380 | 1,800 | PILIBANGA |
| 28 | Kanji | 2,385 | 2,400 | 2,380 | UDAIPUR (GRAIN) |
| 29 | Green Peas | 2,450 | 2,450 | 2,450 | KOTA (GRAIN) |
| 30 | Tinda | 2,500 | 2,500 | 2,500 | Sri GANGANAGAR (FV) |
| 31 | Bitter gourd | 2,500 | 3,000 | 2,000 | UDAIPUR (FV) |
| 32 | Cucumber (Kheera/kakdi) | 2,500 | 3,000 | 2,000 | CHITTORGARH |
| 33 | Groundnut pods (raw) | 2,500 | 3,000 | 2,000 | CHITTORGARH |
| 34 | Bhindi(Lady Finger) | 2,800 | 3,000 | 2,500 | CHITTORGARH |
| 35 | Colacasia | 2,800 | 3,000 | 2,500 | CHITTORGARH |
| 36 | Bajra(Pearl Millet) | 2,900 | 2,900 | 2,900 | KOTA (GRAIN) |
| 37 | Arndi | 2,979 | 2,979 | 2,979 | RANI |
| 38 | Rose(Loose) | 3,000 | 3,500 | 2,500 | JODHPUR (F V) |
| 39 | Gur(Jaggery) | 3,150 | 3,175 | 3,125 | AABU ROAD |
| 40 | Brinjal | 3,200 | 3,500 | 3,000 | CHITTORGARH |
| 41 | Cabbage | 3,200 | 3,500 | 3,000 | CHITTORGARH |
| 42 | Lime | 3,500 | 4,000 | 2,000 | AJMER (F V) |
| 43 | Bottle gourd | 3,500 | 4,000 | 3,000 | CHITTORGARH |
| 44 | Chilly Capsicum | 3,500 | 4,500 | 3,000 | CHITTORGARH |
| 45 | Maize | 3,570 | 3,570 | 3,570 | ANTAH |
| 46 | Wheat | 3,625 | 1,850 | 1,775 | JODHPUR (GRAIN) |
| 47 | Soyabean | 3,895 | 4,018 | 3,561 | JHALRAPATAN |
| 48 | Methi Seeds | 3,950 | 3,950 | 3,950 | MERTA CITY |
| 49 | sugar | 3,975 | 3,975 | 3,975 | PALI |

| No. | Commodity | Modal Price (Rs./Quintal) | Max. Price (Rs./Quintal) | Min. Price (Rs./Quintal) | Market |
|---|---|---|---|---|---|
| 50 | Tomato | 4,000 | 4,000 | 4,000 | PALI |
| 51 | Tomato | 4,000 | 4,025 | 3,975 | AABU ROAD |
| 52 | Amla | 4,000 | 4,100 | 4,000 | UDAIPUR (GRAIN) |
| 53 | Cluster beans | 4,000 | 5,000 | 3,000 | JODHPUR (F V) |
| 54 | Tomato | 4,000 | 5,000 | 3,000 | JODHPUR (F V) |
| 55 | Fuhadh | 4,110 | 4,175 | 4,050 | UDAIPUR (GRAIN) |
| 56 | Cauliflower | 4,200 | 4,500 | 4,000 | CHITTORGARH |
| 57 | Mustard | 4,391 | 4,470 | 3,985 | LALSOT |
| 58 | Wool | 4,400 | 5,000 | 3,800 | KEKRI |
| 59 | Ginger | 5,000 | 5,200 | 4,800 | BIKANER ( F V W) |
| 60 | Methi | 5,000 | 5,200 | 4,800 | UDAIPUR (GRAIN) |
| 61 | Lemon | 5,000 | 6,000 | 3,500 | CHITTORGARH |
| 62 | Mehndi | 5,000 | 6,750 | 2,250 | SOJAT ROAD |
| 63 | Jowar(Sorgham) | 5,016 | 5,016 | 2,700 | RAMGANJMANDI |
| 64 | Chaula | 5,200 | 5,500 | 5,000 | UDAIPUR (GRAIN) |
| 65 | Cowpea (Lobia)(Asparagus) | 5,360 | 5,360 | 5,360 | KUCHAMAN CITY |
| 66 | American Cotton ( Narma) | 5,371 | 5,371 | 5,371 | BIJAY NAGAR |
| 67 | Groundnut | 5,500 | 6,000 | 4,800 | NIMBAHERA |
| 68 | Green ginger | 5,500 | 6,000 | 5,000 | CHITTORGARH |
| 69 | Moath Dal | 5,826 | 5,826 | 5,826 | NOHAR |
| 70 | Grapes | 5,900 | 5,900 | 5,900 | Sri GANGANAGAR (FV) |
| 71 | Mango | 6,000 | 8,000 | 3,000 | CHITTORGARH |
| 72 | Gwar | 6,193 | 6,386 | 6,000 | DAUSA |
| 73 | Plum | 6,200 | 7,000 | 4,600 | AJMER (F V) |
| 74 | Kabuli Chana(Chickpeas-White) | 6,685 | 6,685 | 6,685 | GHARSANA |
| 75 | Corriander | 6,750 | 7,500 | 6,000 | IKLERA |
| 76 | Bengal Grams(Gram) | 6,940 | 6,940 | 6,940 | NOHAR |
| 77 | Litchi | 7,000 | 7,200 | 6,800 | BIKANER ( F V W) |
| 78 | aniseed | 7,100 | 7,200 | 6,700 | LALSOT |
| 79 | Taramira | 7,160 | 7,190 | 7,140 | CHOMU |
| 80 | Green Grams (Moong) | 7,200 | 7,200 | 4,000 | Sri GANGANAGAR(Grain) |
| 81 | Arhar (Tur) | 7,200 | 7,350 | 7,000 | ALWAR |
| 82 | Garlic | 7,350 | 7,600 | 7,100 | JALOR |
| 83 | Linseed | 7,450 | 7,600 | 7,300 | PRATAPGARH |
| 84 | Jamun | 8,000 | 10,000 | 7,000 | JODHPUR (F V) |
| 85 | Lentil(Masur) | 8,400 | 9,000 | 8,250 | UDAIPUR (GRAIN) |
| 86 | Til | 8,400 | 9,000 | 8,250 | UDAIPUR (GRAIN) |
| 87 | Mousambi | 8,600 | 9,100 | 8,100 | JALOR |
| 88 | Pomegranate | 9,000 | 9,200 | 8,800 | BIKANER ( F V W) |
| 89 | Isbgol | 11,000 | 11,500 | 8,400 | BHINMAL |
| 90 | Squash(Chappal Kadoo) | 11,000 | 12,000 | 10,000 | JALOR |
| 91 | Chili Red | 11,000 | 14,000 | 8,000 | JODHPUR (GRAIN) |
| 92 | Chilly | 11,000 | 14,000 | 8,000 | JODHPUR (GRAIN) |
| 93 | Pine Apple | 11,500 | 12,000 | 11,000 | JALOR |
| 94 | Black Grams (Urd Beans) | 11,891 | 11,891 | 11,891 | JHALRAPATAN |
| 95 | Ashwgndh | 12,010 | 18,001 | 8,501 | RAMGANJMANDI |
| 96 | Apple | 13,000 | 16,000 | 11,000 | CHITTORGARH |
| 97 | Corriander seed | 13,300 | 13,300 | 13,300 | BIKANER (GRAIN) |
| 98 | Cummin Seed(Jeera) | 15,650 | 15,650 | 15,650 | BHINMAL |
| 99 | Cummin Seed(Jeera) | 15,650 | 16,590 | 13,900 | MERTA CITY |
| 100 | Ajwain | 17,650 | 17,650 | 17,650 | FATEHNAGAR |

*Source: Department of Agricultural Marketing Website (Last updated: 19/06/2016)*

# *Attachment 2.6.7*
# *Current Situation of Food Processing Industry and Distribution Industry*

# Current Situation of Food Processing Industry and Distribution Industry

## I. Food Processing Industry

### 1. Size of the Industry

State-wise estimated number of factories and enterprises in the food processing industries indicate that Rajasthan accounts for around 2~4% share of the Indian food processing industries (Table 1 and Table 2). The information is also supported by another study showing that Rajasthan accounts for 3% share in the state-wise number of organized food processing units as one of the major food processing states[1].

**Table 1: State-wise Estimated Number of Factories in the Food Processing Industries (registered)**

| Rank | State | No. of Factories | Share (%) |
|---|---|---|---|
| 1 | Andhra Pradesh | 5,735 | 15.4 |
| 2 | Tamil Nadu | 5,161 | 13.9 |
| 3 | Telangana | 3,716 | 10.0 |
| ~ | ~ | ~ | ~ |
| 13 | Odisha | 931 | 2.5 |
| ***14*** | ***Rajasthan*** | ***795*** | ***2.1*** |
| 15 | Madhya Pradesh | 738 | 2.0 |
| ~ | ~ | ~ | ~ |
| 33 | Andaman & Nicobar Islands | 6 | 0.0 |
| | Total | 37,175 | 100.0 |

*Source: Prepared by JICA Survey Team based on Annual Survey of Industries, 2012-13 (Ministry of Statistics and Programme Implementation)*

**Table 2: State-wise Estimated Number of Enterprises in the Food Processing Industries (un-registered)**

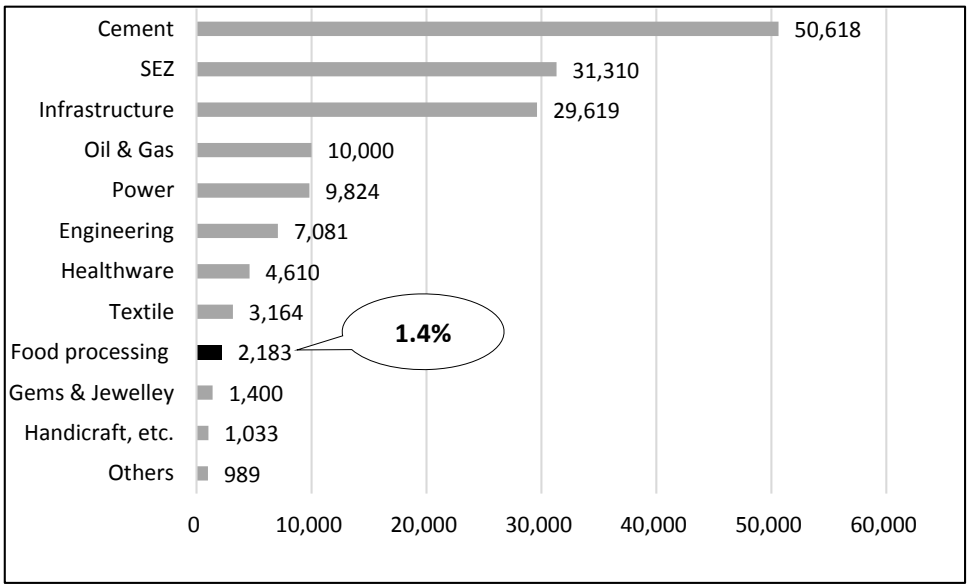
| Rank | State | Manufacture of Food products | Manufacture of Beverages | Total | Share (%) |
|---|---|---|---|---|---|
| 1 | Uttar Pradesh | 347,059 | 2,892 | 349,951 | 15.6 |
| 2 | Maharashtra | 221,119 | 1,322 | 222,441 | 9.9 |
| 3 | Andhra Pradesh | 188,420 | 22,577 | 210,997 | 9.4 |
| ~ | ~ | ~ | ~ | ~ | ~ |
| 9 | Madhya Pradesh | 101,266 | 1,707 | 102,973 | 4.6 |
| ***10*** | ***Rajasthan*** | ***98,090*** | ***845*** | ***98,935*** | ***4.4*** |
| 11 | Karnataka | 95,140 | 652 | 95,792 | 4.3 |
| ~ | ~ | ~ | ~ | ~ | ~ |
| 35 | Sikkim | 34 | 15 | 49 | 0.0 |
| | Total | 2,030,286 | 210,909 | 2,241,195 | 100.0 |

*Source: National Sample Survey 67th Round (July 2010- June 2011) on Unincorporated Non-agricultural Enterprises (Excluding Construction) in India*

However, as Ministry of Food Processing Industries (MoFPI) presents, units under operation in Rajasthan are mostly in the small- and micro-scale sectors while only about 1% of total units are in the medium- and large-scale sectors[2].

[1] Food Processing Industry in India: S&T Capability, Skills and Employment Opportunities, 2013
[2] Investors' Portal of MoFPI (Website)

From the view of investment, as seen in the investments through Resurgent Rajasthan[3], the share of the food processing industry is currently small, accounting for only 1.4% in all the state's industries (Figure below). As for investment from Japanese-affiliated companies, only 2 companies are engaged in food-related industries out of 169 companies investing in Rajasthan as of October 2015[4].




*Source: Prepared by JICA Study Team based on Mapping of Human Resources and Skills for Rajasthan – 2015 (published in 2008)*

**Figure: Investments through Resurgent Rajasthan (INR Crore)**

As for the government projects in the food processing industry, there are Agri Export Zones, Mega Food Parks, and Agro Food Parks as mentioned in Section 2.6.2 of the Main Report. In addition, there are 4 Cold Chain Projects under the Scheme for Cold Chain, Value Addition and Preservation Infrastructure by MoFPI (Table 9 in Page 10). The one in Alwar has been already completed and started commercial operations.

## 2. Potential for the Industry

MoFPI lists up the activities having potential in the food processing sector of Rajasthan, considering the availability of raw materials crops in the state and adjoining areas (Table 3).

**Table 3: Potential Areas for Agro and Food Processing in Rajasthan**

| Crops | Processed Products that may be derived |
|---|---|
| Wheat | Noodles, Flours (fortified), biscuits & bakery, breakfast cereals & mixes |
| Maize | Flour, corn flakes, corn meal, corn oil, starch and its derivatives (like glucose, starch), ethanol, alcohol, poultry feed etc. |
| Pulses | Ingredient to various main stream processing, snacks |

[3] Resurgent Rajasthan is the state's investors' summit conducted under the responsibility of Bureau of Investment Promotion
[4] Yakult Danone India Private Limited in Jaipur and NAGOMI CONSULTING Pvt. Ltd. in Neemrana (JETRO 2016)

| Crops | Processed Products that may be derived |
|---|---|
| Oil seeds | Refined oil, cattle feed |
| Guar / Guar Gum | Multiple uses including as lubricants in industrial applications |
| Potato | Chips, flakes, powder, fries, starch, etc. |
| Cauliflower, Okra, Carrot, Chilly | Fresh cut, frozen and assorted products |
| Peas and Beans | Fresh and frozen products |
| Tomato | Puree, juice, concentrate, ketchup, sauce etc. |
| Guava | Juice, concentrate, fruit drinks, frozen halves, candies |
| Citrus, *Aonla*, *Ber* | Juice, candy, powder |
| Mango | Pickle, *aam papad*, chutney, candy, dried mango powder etc. |
| Garlic, Chilly, Cumin, Fennel, Fenugreek | Whole packaging, powder and ingredient to various main stream processing |
| Raw Milk | Butter, crème, *ghee*, cottage cheese, flavoured milk, spreads, milk powder, ice-cream, curd, buttermilk |

*Source: Investors' Portal of MoFPI (website)*

Especially, Government of Rajasthan sees the state has vast potential for future expansion of the agro and food processing industry considering its agricultural productivity as below[5].

- Largest producer of mustard, guar seed and moth beans,
- Largest producer of spices such as fenugreek, coriander, cumin and fennel,
- Second largest producer of gram and total oil seeds,
- Third largest producer of soya bean and fourth largest producer of ground nut,
- Fourth largest producer of food grains in India (Contributing about 20.45% in the state's GDP),
- Fourth largest producer of wheat and largest producer of coarse grains,
- Largest population of cattle, sheep and camels (Contributing 12% of milk, 35% of goat meat & 40% of wool to the country's production)

By contrast, fruits/vegetables processing seems to have lower potential. According to the Project Manager Agent of Rajasthan State Agricultural Marketing Board, 90~95% of fruits/vegetables are habitually consumed fresh in Rajasthan and there is only 5~10% of fruits/vegetables surplus due to low production. As a result, only 1~2% of fruits/vegetables are currently processed at the industrial level. For example, Rajasthan produces large quantities of *aonla* (Indian gooseberry) but the domestic demand for processed *aonla* is low. The fruit is thus processed and exported to other states by large-scale processors. As well, small-scale fruits/vegetables processing and marketing are not very common in Rajasthan. KVKs offer training courses on primary fruits/vegetables processing to rural women only for home consumption or village-level marketing. Selling prices are rather unreasonable and processors can hardly recover the profit. This is because equipment/facilities are not accessible to them, techniques for processing/packaging/branding are not sufficient for higher level marketing, and women are not involved in higher level marketing traditionally.

[5] Resurgent Rajasthan Website (http://resurgent.rajasthan.gov.in/focus-sectors/agro-food-processing)

## 3. Private Processing Companies

Resurgent Rajasthan mentions that major players in the food processing industry of Rajasthan are represented by AWB, Cargill, Field Fresh Foods (Del Monte), ITC, and Reliance. In the case of middle-/small-scale companies, various processors in Jaipur and some other cities are listed up in indiamart's website. It seems there are many processors for spices, grain/pulses, dairy products, ayurvedic food supplements (e.g. aloe juice), and less for fruits/vegetables (canned, dehydrated, juice). In the box below, an example of a large-scale enterprise dealing with soya bean is introduced.

**Case of Shiv Edibles Ltd.**

Overview

Shiv Edibles Ltd., mainly producing edible oil from soybean and mustard seeds, etc., started its operation in Kota Agro Food Park in 2005. Processing capacity of its plant is, holding 280 staff, 30,000t /month to process 2.8% of soybean produced in the country (2015). The plant is operated throughout the year (soybean: October – November, mustard: April - September).

Procurement of Raw Materials Crops

The company purchases soybean and mustard seeds at public markets in Kota and nearby areas with no direct purchase from farmers. 80% of its products is sold during October and December while 20% is sold during January and March. To reflect on prices, purchasers assess quality of raw materials crops by touching, chewing and also using their own lab equipment.

Processing and Marketing

The company sells processed oil (soybean oil: Rs.70-71/kg, mustard oil: Rs.80-85/kg) within 200km (Kota, Jaipur, Sawai Madhopur, etc.), through wholesalers in large cities or retailers in towns.
Byproducts (soybean cake, mustard seed cake) are transported to other plants directly or through traders/brokers to produce feed or soya bajhi (soya meat).
They started producing soy lecithin a few years ago to export to EU through Cargill, etc. In 2015, 700t of soya lecithin was exported at Rs.100/kg. For future options, they are interested in tofu processing. Soy milk is not so popular as it used be, but might trigger a boom again sometime.

(based on an interview to Director of Shiv Edibles Ltd.)

**Example of Soya Lecithin (cited from Shiv group's website)**

Shiv Edibles Pvt. Ltd's food grade liquid Soya Lecithin (Water Insoluble) is made from Non-GMO Indian soya beans. It is manufactured in controlled environment without any external contamination from ASPL's own de-gummed Soya oil to keep the traceability and superior quality required by our customers. Our Lecithin has been processed to keep it anti-freezing at lower temperature to reduce microbial contamination to the minimum. Soya Lecithin is a naturally occurring group of phospholipids found in nearly every living cell it consists of three types of phospholipids; phosphatidylcholine (PC), phosphatidylethanolamine (PE) and phosphotidylinositol (PI). It is used as an emulsifier or stabilizer in manufacturing variety of food products, cosmetics, pharmaceuticals, health care and animal feeds, among various other applications.

**Health Benefits:**

- Good for methyl metabolism, cholinergic neurotransmission, transmembrane signalling, and lipid-cholesterol transport.
- Helpful for liver function, reproduction and fatal development and physical and athletic performance.
- Useful for pharmaceutical and cosmetic applications and various industrial uses such as paints, textiles, lubricants and waxes.

## II. Distribution Industry

The general channel of food distribution in India includes exporters (in the case of produce to export), wholesalers, distributors, transporters, large-size retailers and local retailers. However, the channel does not function systematically or effectively as a system to control and operate commodity distribution is lacking in terms of both hardware aspect (warehouses, cold chains, etc.) and software aspect (inventory control, delivery management system, etc.) [6].

There is no specific data to assess current condition (efficiency and functionality) of distribution industry in Rajasthan, but it could be assumed that the State is probably not excluded from all other states in India facing the issue pointed above. The details of Rajasthan's distribution industry are described below.

### 1. Logistics

Rajasthan currently has 33 public warehouses managed by Central Warehousing Corporation (CWC)[7] and 91 public warehouses managed by State Warehousing Corporation (SWC)[8] both at the district level, and 886 warehouses funded by National Bank for Agriculture and Rural Development (NABARD) at the village level (Table 4). According to SWC's website, their warehouses are located mainly at public markets' yards and some at sub-yards.

**Table 4: Number of Warehouses in Rajasthan**

| Managed by | Managed at | Number |
|---|---|---|
| Central Warehousing Corporation (CWC) | District level | 33 |
| State Warehousing Corporation (SWC) | District level | 91 |
| NABARD support | Village level | 886 |

*Source: Farmers' Portal Website (Ministry of Agriculture and Farmers Welfare, GoI_2015) for the data of CWC and NABARD, SWC's website for the data of SWC's warehouses (updated in January, 2016)*

Both CWC's and SWC's warehouses are located in every district as listed up in Table 5 and Table 6, respectively. Average capacity of a warehouse is around 12,000 MT for both CWC and SWC cases, and average percentage of SWC warehouses utilisation is 65% on the capacity basis (including reservation). According to officers of CWC and SWC, warehouse users are mainly private companies, government companies (Food Corporation of India, a public grain distributors, is presumably included) and wholesalers dealing with food grains as well as farmers.

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[6] JETRO (2012)

[7] CWC is "a premier Warehousing Agency in India, established during 1957 providing ***logistics support to the agricultural sector***, and one of the biggest public warehouse operators in the country offering logistics services to a diverse group of clients". "CWC is operating 465 warehouses across the country with a storage capacity of 11.59 million tonnes providing warehousing services for a wide range of products ranging from ***agricultural produce*** to sophisticated industrial products. Warehousing activities of CWC include ***food grain warehouses***, industrial warehousing, custom bonded warehouses, container freight stations, inland clearance depots and aircargo complexes" (cited from CWC's website).

[8] "The Rajasthan State Warehousing Corporation has two shareholders, the Government of Rajasthan and the Central Warehousing Corporation. SWC may run warehouses in the state for the storage of ***agricultural produce***, seeds, manures, fertilizers, agricultural implements and notified commodities" (cited from SWC's website).

**Table 5: Warehouses Managed by CWC in Rajasthan**

| No. | Warehouse | Project Description (Location) | Capacity (MT) |
|---|---|---|---|
| 1 | BHIWADI | C/o Jaquar & Company Pvt. Ltd., SP-496, RIICO Inld Area, Bhiwadi - 301019 | 4,356 |
| 2 | ALWAR | A-315, NSC, Oppt. ED, Paryware Pvt. Ltd. Co. Alwar | 3,574 |
| 3 | BARAN | Spl. No. 01 ,RIICO Indl Area, Baran Road, Baran | 5,000 |
| 4 | BHARATPUR | Plot No. G-162 to 165 & F-166 to 171, Brij Ind. Area, Behind Nafed Plant, Phase-II, Hathni Road, Bharatpur | 9,674 |
| 5 | BIKANER | Behind Sabzi Mandi, Pugal Road, Unit-I, Bikaner | 25,400 |
| 6 | BIKANER-II | Opposite Govt. Engineering College, Karni Indutrial Area, Ph.II Bikaner-334004 | 5,000 |
| 7 | SRIGANGANGR-I | Near Power House Sriganganaga-335001 | 25,200 |
| 8 | SRIGANGANGR-II | Udyog Vihar Plot No. E-194 to202 Sriganganaga-335001 | 10,000 |
| 9 | KESARISINGHPUR | C/o ARDC Godown,Mizewali Road,Kesrisinghpur Distt.Srigangar | 10,176 |
| 10 | HANUMANGARH TOWN | C/o FCI, Opp. Railway Station, Hanumangarh Town | 13,262 |
| 11 | HANUMANGARH-I | Sector - 8, New Mandi, Hanumangarh Junction, Hanumangarh | 21,200 |
| 12 | HANUMANGARH-II | RIICO Phase-II , Opposite RIICO, Water Works, Hanumangarh | 15,000 |
| 13 | TIBBI | 10, GGR, Hanumangarh Road, Tibbi, Distt. Hanumangarh | 1,000 |
| 14 | SITAPURA-I | Plot No.SPL-1296,EPIP Sitapura, Ind. Area, Jaipur-302002 | 14,870 |
| 15 | SITAPURA-II | Plot No.SP-1,RIICO Industrial Area,Sitapura, Jaipur | 11,729 |
| 16 | KOTPUTLI | Near Cement Factory,Vill.-Ramsinghpura Gopalpura Road,Kotputll, Distt. Jaipur. | 5,000 |
| 17 | JHUNJHUNU | Plot No. SP-287 RIICO Industrial Area, | 5,000 |
| 18 | SURAJGARH | Bhuana Road, Surajgarh-333029 | 2,868 |
| 19 | KOTA I | Ind. Area DCM Road, Nr New Grain Market Kota-324007 | 36,830 |
| 20 | KOTA II | lndraprasth md. Area, Road,No. 1, Near Daknia Railway Station Kota-324005 | 49,300 |
| 21 | KOTA III | Plot No. SP-1, Kuber Ind. Area, Ranpur, Kota III | 25,000 |
| 22 | RAMGANJ MANDI | Khairabad Road, Ramganj Mandil Distt.-Kota | 9,893 |
| 23 | NAGAUR | Nr. All India Radio Basni Road, Nagaur- 341001 | 7,401 |
| 24 | PARABATSAR | C/o ARDC Godown, Near Old Rly. Station.Parbatsar, Distt. Nagaur | 28,093 |
| 25 | SIKAR | Jagmalpura, Via-Katrathal, Post-Bhadwasi ,Sikar-33200 1 | 5,000 |
| 26 | SRIMADHOPUR | Hanspur Road, Srimadhopur-332715 | 20,600 |
| 27 | DEOLI | C/o Juptier Metal Pvt. Ltd., NH—12, Deoli Distt : Tonk 01434 239249 | 5,000 |
| 28 | UDAIPUR-I | | 5,000 |
| 29 | FATEHNAGAR | MOR Mills Product, Plot No. H-49 Road No.2, RIICO Indl Area, Fatehnagar-313205 | 3,106 |
| 30 | Central Warehouse | Opposite Krishna Dharma Kanta, Udaipur By Pass. Beawar, Distt. Ajmer | 14,849 |
| 31 | Certral Warehouse | Katori Wala Tibara, Near Water Works, Tizara Road, Alwar | 8,133 |
| 32 | Central Warehouse | Village MOR ,Kushalgarh Distt.Banswara. | 3,400 |
| 33 | Central Warehous | Plot No.G-162 to 165,F-166 to 171, Behind NAFED Plant, Phase-II, Brij Industrial Area, Hahteni Road, Bharatpur-321301 | 9,674 |
| | | ***Total*** | ***419,588*** |
| | | ***Average*** | ***12,715*** |

*Source: Farmers' Portal Website (Ministry of Agriculture and Farmers Welfare, GoI_2015)*

**Table 6: Warehouses Managed by SWC in Rajasthan**

| No. | District | Number | Capacity (MT) | % utilisation |
|---|---|---|---|---|
| 1 | Ajmer | 4 | - | 49 |
| 2 | Alwar | 2 | - | 106 |
| 3 | Banswara | 1 | - | 52 |
| 4 | Baran | 5 | - | 62 |
| 5 | Barmer | 2 | - | 75 |
| 6 | Bharatpur | 3 | - | 98 |
| 7 | Bhilwara | 3 | - | 86 |
| 8 | Bikaner | 3 | - | 55 |
| 9 | Bundi | 4 | - | 92 |
| 10 | Chittorgarh | 3 | - | 102 |
| 11 | Churu | 2 | - | 0 |
| 12 | Dausa | 0 | - | 68 |
| 13 | Dholpur | 4 | - | 122 |
| 14 | Dungarpur | 1 | - | 10 |
| 15 | Hanumangarh | 1 | - | 94 |
| 16 | Jaipur | 7 | - | 51 |
| 17 | Jaisalmer | 3 | - | 87 |
| 18 | Jalore | 2 | - | 77 |
| 19 | Jhalawar | 3 | - | 41 |
| 20 | Junjhunu | 3 | - | 0 |
| 21 | Jodhpur | 0 | - | 77 |
| 22 | Karauli | 4 | - | 93 |
| 23 | Kota | 2 | - | 60 |
| 24 | Nagaur | 3 | - | 86 |
| 25 | Pali | 2 | - | 32 |
| 26 | Pratapgarh | 3 | - | 41 |
| 27 | Rajasmand | 1 | - | 13 |
| 28 | Sawaimadhopur | 1 | - | 88 |
| 29 | Sikar | 2 | - | 64 |
| 30 | Sirohi | 1 | - | 25 |
| 31 | Sri Ganganagar | 1 | - | 98 |
| 32 | Tonk | 13 | - | 53 |
| 33 | Udaipur | 3 | - | 86 |
| ***Total*** | | ***91*** | ***1,100,440*** | ***-*** |
| ***Average*** | | ***-*** | ***12,093*** | ***65*** |

*Source: SWC website*

## 2. Private Distribution System

According to a private vegetable supplier in Delhi NCR, some suppliers deliver fruits/vegetables to customers through courier services (parcel delivery companies). However, there are also problems of information leak or poor storage condition of vegetables during transportation. Therefore, it is probably more common among suppliers in Delhi NCR to deliver fruits/vegetables by their own vehicle (personal communication - July 2016). There are also some private courier services operating in large cities in Rajasthan as an Internet search tells, but delivery of fresh food items through such services is probably not so common in Rajasthan, either, also in a nod to the situation in Delhi NCR above.

An example of a private vegetable supplier based in Delhi NCR is described in the box below[9].

[9] For the detailed list of more suppliers, refer to "Supplemental information 4" of "Attachment 5.5.4: Activity Plan: Brand building for high-value added agriculture produce".

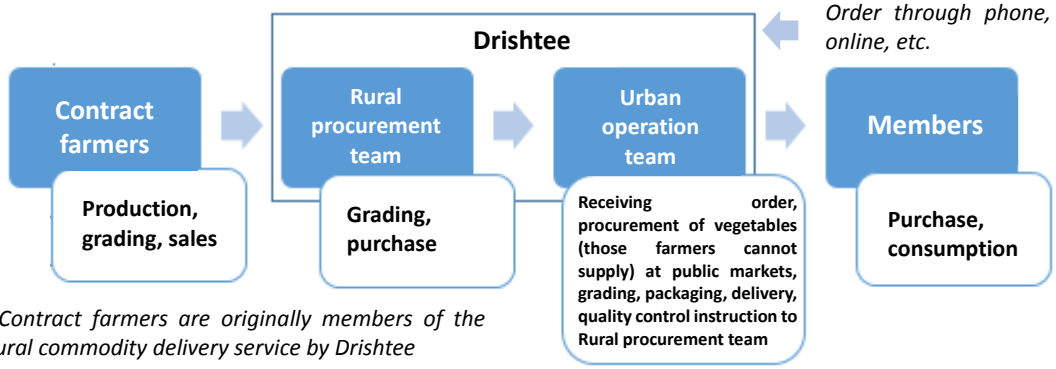
## "Food Basket" by Drishtee

Drishtee Development & Communication Ltd., recognized as a social enterprise based in Delhi NCR, started its operation in 2000. Since then, Drishtee has supplied daily commodities to rural areas as one of their activities, and recently started "Food Basket", an agricultural produce delivery service.

Overview of Food Basket

Drishtee delivers fruits/vegetables procured at villages within its commodity supply chain and delivery them to urban individual consumers. Currently, 60 farmers and 200 families in Uttara Pradesh are targeted, which could be hopefully increased in the future through marketing. At the very beginning of the activity, members were only 10-15 families. Through low-cost step-by-step advertising (discount for members who introduce new members, putting posters in apartments or offices, word-mouth advertising, etc.), now the number has been increased to 200 families.

Supply chain of Food Basket is explained in Figure below.




**Contract farmers are originally members of the rural commodity delivery service by Drishtee*

Delivery is done everyday except Sundays and holidays. Quality is controlled under the Urban operation team, which is also responsible for quality control instruction to the Rural procurement team. Contract farmers are not trained directly by Drishtee but they understand quality standards required by the Rural procurement team (size, appearance). When supply from farmers cannot meet demand from members, the Urban operation team needs to procure extra vegetables at public markets to make up for the lack of supply by farmers. The team checks retail prices of Mother Dairy's commodities everyday so that their selling prices will not exceed government ones (Mother Dairy = corporation established by National Dairy Development Board, which produces and sell dairy products and other agricultural produce).

Issues and Future

Contents of "Food basket" is being improved through trial and error. At present, the Urban operation team arranges custom-made baskets, but they intend to sell ready-made ones in the future. Moreover, they hope to supply vegetables only from their contract farmers without depending on public markets. Addition of grain, food legume, dairy products to food basket is also under consideration.

As for packaging, recycle bags are used for longer-contract customers. Environmental-friendly materials could be used to wrap individual vegetables instead of currently used plastic materials.


Food basket for individual customers

Although Drishtee promotes freshness and safety of their produce, no clear standards exist to convey them to consumers/customers. At present, they try to increase customers' recognition by recommending them to visit production sites, etc., or by providing places for exchange opinions. There customers have told, at least, their sensuous impression that "the produce has good tastes and appearance".

(based on an interview to Co-founder of Drishtee)

## 3. Cold Chain

According to the Associated Chambers of Commerce of India (ASSOCHAM), the market size of Indian cold chain industry is expected to increase from INR 200,000 crore in 2013 to INR 515,000 Crore in 2017. On the other hand, JETRO points out that 40% of fruits/vegetables is discarded every year in India before getting in a distribution chain, causing annual loss of INR 440,000 crore. This is mainly because of India's harsh natural environment and undeveloped system of logistics (2012).

The Indian cold chain industry is mostly composed of small-scale logistic companies and delivery companies operated locally. There are also some large-size companies with nationwide distribution network, including Coldex and Gati Kause based in Delhi, Kelvin and Snowman in Mumbai, Transafe in Hyderabad, all of which own hundreds of reefer vans and manage cold storages. Their large-size customers include international food chains such as Starbucks, KFC, MacDonald's' and Domino Pizza (JETRO 2012).

In the case of Rajasthan, as mentioned in Page 4, some large-scale private companies are operating in the food processing industry probably using their own cold storages. Besides, Shiv group, the one mentioned in Page 4, is listed up as one of the cold chain projects financially assisted by Ministry of Food Processing Industries (Table 9). As they mention "Our Lecithin has been processed to keep it anti-freezing at lower temperature to reduce microbial contamination to the minimum"[10], its products require lower temperature for storage.

Rajasthan's government cold chain projects are indicated below (Table 7~10).

### (a) Cold Chain Projects in Rajasthan

**Table 7: Cold Storage Projects Sanctioned under the National Schemes**

| Scheme | Plan/Period | No. of Projects | Financial assistance (Rs. in Lakh) | Capacity (MT) |
|---|---|---|---|---|
| National Horticulture Mission | 11th Plan: 2007 – 2012 | 20 | 1,121.24 | 89,267 |
| | 12th Plan: 2013 – 2015 | 4 | 280.15 | 13,525 |
| | ***Total*** | ***24*** | ***1,401.39*** | ***102,792*** |
| National Horticulture Board | 11th Plan: 2007 – 2012 | - | 251.9 | 33,200 |
| | 12th Plan: 2013 – 2015 | - | 820.3 | 46,400 |
| | ***Total*** | ***-*** | ***1,072.2*** | ***79,600*** |
| Ministry of Food Processing Industries | 11th Plan: 2007 – 2012 | - | ***705*** | ***80*** |
| | 12th Plan: 2013 – 2015 | - | ***0*** | ***0*** |
| | ***Total*** | ***-*** | ***705*** | ***80*** |

*Source: Report of the Task Force on Cold Chain Projects (MoFPI)*

[10] Shiv Group's website (http://shivgroupindustries.com/portfolio/soya-lecithin/)

**Table 8: Other Cold Chain Components Sanctioned under National Horticulture Mission Scheme**

| Plan/Period | Reefer van | | Cold room etc. | | Ripening chamber | |
|---|---|---|---|---|---|---|
| | No. of projects | Financial assistance (Rs. in Lakh) | No. of projects | Financial assistance (Rs. in Lakh) | No. of projects | Financial assistance (Rs. in Lakh) |
| 11th Plan: 2007 – 2012 | 9 | 46 | 1 | 0.24 | 6 | 123.8 |
| 12th Plan: 2013 – 2015 | 7 | 60 | - | - | 8 | 274.6 |
| ***Total*** | ***16*** | ***106*** | ***1*** | ***0.24*** | ***14*** | ***398.4*** |

*Source: Report of the Task Force on Cold Chain Projects (MoFPI)*

Under the Scheme for Cold Chain, Value Addition and Preservation Infrastructure, MoFPI has approved 4 cold chain projects targeting private companies in the state. Out of these 4 approved projects, the project in Alwar has been already completed and started commercial operations.

**Table 9: Cold Chain Projects Financially Assisted by Ministry of Food Processing Industries**

| Project (Company) | | District | Sector | Project cost (Rs. In Lakh) | Approved amount of grant-in-aid (Rs. In lakh) | Status of implementation (as of Sept. 2014) |
|---|---|---|---|---|---|---|
| 1 | Sarawagie Fresh | Jaipur | Dairy | 2,104.00 | 674.18 | Withdrawn |
| 2 | Shiv Health Foods LLP | Kota | Dairy | 3,300.00 | 810.70 | 75% completion on the project |
| 3 | Shree Shubham Logistics Ltd. | Kota | Fruits & Vegetables | 2,847.00 | 1,000.00 | 25% progress |
| 4 | Jhunsons Chemicals Pvt. Ltd. | Alwar | Irradiation | 1,773.00 | 705.96 | Achieved completion and commercial production started |

*Source: Report of the Task Force on Cold Chain Projects (MoFPI)*

Small Farmers' Agri-business Consortium (SFAC) supports cold storage projects under Venture Capital Assistance (Table 10).

**Table 10: Cold Storage Projects Financially Assisted by Venture Capital Assistance (SFAC)**

| Company | | District | Capacity |
|---|---|---|---|
| 1 | M/s. Hariyali Agrotech Pvt. Ltd. | Jaipur | Grading: 3,650MT<br>Packing: 3,650MT<br>Sorting & washing: 3,650MT |
| 2 | M/s. Agrasen Sheet Grah Pvt. Ltd. | Dholpur | 56,188 Qtls. |
| 3 | M/s Pratap Cold Storage P. Ltd. | Dholpur | Fruits & Vegetables |
| 4 | M/s Maa Kaila Devi Cold Storage | Dholpur | Irradiation |
| 5 | M/s Shri Gajanand Sheetgrah P. Ltd. | Dholpur | - |
| 6 | M/s C B Cold Storage Private Ltd. | Jaipur | - |

*Source: Report of the Task Force on Cold Chain Projects (MoFPI)*

### (b) Cold Storages in Rajasthan

Currently, there are 6,300 cold storage facilities with 3 crore MT capacity in total in whole India[11]. In the case of Rajasthan, among110 cold storages registered up to 2015 (1.7% of total cold storages in India), most of them are private ones (100) and there are 9 cooperatives storages and only one public storage[12]. Most of them are for multipurpose (Table 11). About 30% of cold storages is concentrated in Jaipur as of 2009 (Table 12). According to Farmers' Portal Website[13], average capacity of a cold storage is about 700MT, ranging from 1MT to 25,000MT.

**Table 11: Number of Cold Storage in Rajasthan (commodity-wise)**

| Commodities | Number |
|---|---|
| Potato | 19 |
| Fruits & vegetables | 1 |
| Meat & fish | 0 |
| Milk & milk products | 8 |
| Multipurpose | 79 |
| Others | 4 |
| ***Total*** | ***110*** |

*Prepared by JICA Survey Team based on agmarknet Website (Ministry of Agriculture and Farmers Welfare, GoI_2015)*

**Table 12: Number of Cold Storage in Rajasthan (district-wise)**

| Districts | | Private | Cooperatives | Public | Total |
|---|---|---|---|---|---|
| 1 | Ajmer | 1 | 1 | 0 | 2 |
| 2 | Alwar | 2 | 1 | 0 | 3 |
| 3 | Barmer | 1 | 0 | 0 | 1 |
| 4 | Bharatpur | 14 | 0 | 0 | 14 |
| 5 | Bikaner | 6 | 2 | 0 | 8 |
| 6 | Bundi | 1 | 0 | 0 | 1 |
| 7 | Jaipur | 30 | 2 | 1 | 33 |
| 8 | Dholpur | 1 | 0 | 0 | 1 |
| 9 | Jhalawar | 2 | 0 | 0 | 2 |
| 10 | Jodhpur | 10 | 1 | 0 | 11 |
| 11 | Kota | 4 | 1 | 0 | 5 |
| 12 | Pali | 2 | 0 | 0 | 2 |
| 13 | Sri Ganganagar | 5 | 0 | 0 | 5 |
| 14 | Udaipur | 2 | 1 | 1 | 4 |
| | ***Total*** | ***81*** | ***9*** | ***2*** | ***92*** |

*Prepared by JICA Survey Team based on agmarknet Website (Ministry of Agriculture and Farmers Welfare, GoI_2009)*

[11] JETRO (2014)
[12] agmarknet Website (Ministry of Agriculture and Farmers Welfare, GoI_2015)
[13] Ministry of Agriculture and Farmers Welfare, GoI_2015

# *Attachment 2.7.1*
# *Result of Household Survey on Gender Related Issues*

**Attachment 2.7.1 Result of Household Survey on Gender Related Issues**

## 1. Background of the Survey

The survey was conducted in the beginning of may 2016 for 10 each household in Hanumangarh and Sawai Madhopur District. There is no WUA in Sawai Madhopur while Hanumangarh has WUA and well managed irrigation system. the interviewer asked same questions to husband and wife as a couple, but in few cases they are family members because of unavailability.

## 2. Basic Information on Informant

### 2.1. Age range

| | 20~ | 30~ | 40~ | 50~ | 60~ | 70~ | Total |
|---|---|---|---|---|---|---|---|
| Male | 1 | 2 | **6** | **6** | 4 | 1 | 20 |
| Female | 0 | **7** | 6 | 6 | 1 | 0 | 20 |

### 2.2. Involvement in Agriculture

| | Full time | Part time | Total |
|---|---|---|---|
| Male | 10 | 10 | 20 |
| Female | 15 | 5 | 20 |

### 2.3. Education

| | Illiterate | Just literate | Class 2 | Class 5 | Class 8 | Class 10 | Total |
|---|---|---|---|---|---|---|---|
| Male | **8** | 2 | 0 | 3 | 1 | 6 | 20 |
| Female | 8 | **9** | 1 | 1 | 1 | 0 | 20 |

### 2.4. Land Ownership and Inheritance

| | Land ownership | | Reasons how owned the land | | Who will succeed the land | |
|---|---|---|---|---|---|---|
| | Yes | No | Inherited | Bought | Son | Others |
| Male | 20 | 0 | 20 | 0 | 18 | 2-Family |
| Female | 2 | 18 | 0 | 2 | 1 | 1- Husband |

### 2.5. Experience to Attend Community Meeting

| | Sawai Madhopur | | | |
|---|---|---|---|---|
| | Yes | No | Which meeting | Reason why not attend |
| Male | 9 | 1 | Gram Panchayat | No interest |
| Female | 0 | 10 | | No time-1 |

| | Hanumangarh | | | |
|---|---|---|---|---|
| | Yes | No | Which meeting | Reason why not attend |
| Male | 10 | 0 | WUA | |
| Female | 0 | 10 | | No need-2, Not allowed-3 |

## 3. Major Findings

### 3.1. Roles and Responsibility on Farm Work

In most cases, answers of male and female are consistent: there are few gaps in female's roles and responsibilities at median answer. In land preparation (cleaning), Watering and Post-harvest (packing), male thinks female support them occasionally, but female thinks that they support male every time. On the other hand, female thinks thy support post-harvest (cleaning) occasionally while male judged female support them every time.

### 3.2. Roles and Responsibility on House and Social Work

Compare to farm work, male tends to think they involved in house work more than female thinks such as washing clothes, caring for children and elders, and caring for goat and cattle. On the other hand, female thinks they involved in caring for goat more than male thinks.

### 3.3. Daily Schedule

#### 1) Farming Season

Although 15 female informants out of 20 answered as full time farmer, daily schedule shows that 9 female informants of Hanumangarh out of 10 don't go to their filed during farming season. Since Hanumangarh and Ganganagar farmers have a large filed, it is possible that wife of land owner is not always a farmer.

| **Time** | **Male** | **Female** | |
|---|---|---|---|
| | | **Involving in farm work (11 women)** | **Not involving in farm work (9 in Hanumangarh)** |
| **5:00** | Wake up, Brush, Toilet | Wake up, Tea , Fodder to Cattle | Wake up, Brush, Toilet, Milking |

| Time | Male | Female | |
|---|---|---|---|
| | | **Involving in farm work (11 women)** | **Not involving in farm work (9 in Hanumangarh)** |
| **6:00** | Tea, Caring of Cattle, Bathing | Milking , Butter Churn | Milking, Having Tea, Butter churn |
| **7:00** | | Cleaning house, Cooking food | Cleaning house, Caring of Cattle |
| **8:00** | Have a meal, Go to the field | Cooking food, Bathing | Cooking food |
| **9:00** | Work in the field (Have a meal around 12:00 – 13:00) | Go to the field | |
| **10:00** | | | Cooking food, Bathing |
| **11:00** | | | Bathing, Washing |
| **12:00** | | | Have a meal |
| **13:00** | | | Take a break |
| **14:00** | | | |
| **15:00** | | | Take a break, Caring of cattle |
| **16:00** | | Back to home, Caring for Cattle | Caring of cattle |
| **17:00** | Bring Food for Cattle, Fodder cutting, Back to home, Caring cattle, Tea, Bathing | Milking, Caring for Cattle, Tea | Tea, Feeding cattle |
| **18:00** | | Caring for Cattle, Cooking food | Caring of cattle, Milking, Cooking food |
| **19:00** | House work, Chat with neighbors, Visit local friends | Cooking food | Cooking food |
| **20:00** | | Dinner, wash dishes | |
| **21:00** | Have dinner, Sleep | Sleep | Dinner, wash dishes, Sleep |

**2) Off-season**

| Time | Male | Female |
|---|---|---|
| **5:00** | Wake up, Brush, Toilet, Tea | Wake up, Brush, Toilet, Milking, Tea |
| **6:00** | Tea, Take care of Cattle, House work | Milking, Tea, Butter churn, Cooking food |
| **7:00** | Caring of Cattle, House work, Visit at | Cleaning house, Caring of Cattle, Caring |

| Time | Male | Female |
|---|---|---|
| | Field, Visit in the village, Meeting with the neighbors, | children, Cooking food |
| **8:00** | | Cooking food, Caring of Cattle, Fodder to cattle |
| **9:00** | Bathing, Washing, Gossip and Chat with neighbors | |
| **10:00** | | Cooking food, Caring of Cattle, Bathing, Washing |
| **11:00** | House work, Have lunch | |
| **12:00** | Take a break | Have lunch, Chat with neighbors, Busy with family members |
| **13:00** | | Take a break, Chat with neighbors, Busy with family members |
| **14:00** | | |
| **15:00** | | Take a break, Caring for cattle |
| **16:00** | Tea, Caring for cattle, Go to the field, Go to the village | Take a break, Caring for cattle, Milking, Cleaning of house |
| **17:00** | Caring for cattle | Caring for cattle, Feeding cattle, Tea, Cooking food |
| **18:00** | Caring for cattle, House work, Chat with neighbors | Caring for Cattle, Milking, Cooking Food, |
| **19:00** | Chat with neighbors | Cooking food |
| **20:00** | House work | Cooking food, Dinner, Wash dishes |
| **21:00** | Dinner | Watching TV, Sleep |
| **22:00** | Sleep | |

### 3.4. Access and Control

As same as result of roles and responsibilities mentioned above, answers of male and female are consistent in most cases. While male has access to all most all the properties, female has access on farm land, house, goat and cattle. Regarding control, the result shows all properties are controlled by male. There are gaps on access goat and cattle that male thinks they have more access than female thinks.

### 3.5. Gender Training

There is no one attended gender training before.

### 3.6. Access to Agricultural Services

There is no one received agriculture services, but 2 male out of 20 have an experience to use marketing information. One of them answered that he got information from TV.

## 4. Collected Data

### 4.1. Roles and Responsibility on Farm Work

0:Not at all, 1: Support occasionally, 2 Support every time, 3: Mainly do

| | | Male | | Female | |
|---|---|---|---|---|---|
| | | Answered by male | Answered by female | Answered by male | Answered by female |
| Land preparation (cleaning) | 0 | 0 | 1 | 4 | 3 |
| | 1 | 0 | 0 | 6 | 3 |
| | 2 | 1 | 1 | 7 | 9 |
| | 3 | 19 | 18 | 3 | 5 |
| Land preparation (Plowing by tractor) | 0 | 0 | 0 | 15 | 16 |
| | 1 | 0 | 0 | 5 | 3 |
| | 2 | 0 | 0 | 0 | 1 |
| | 3 | 20 | 20 | 0 | 0 |
| Fertilizer application | 0 | 0 | 0 | 19 | 15 |
| | 1 | 0 | 0 | 1 | 5 |
| | 2 | 0 | 0 | 0 | 0 |
| | 3 | 20 | 20 | 0 | 0 |
| Seed sowing by machine | 0 | 0 | 0 | 20 | 18 |
| | 1 | 0 | 0 | 0 | 2 |
| | 2 | 0 | 0 | 0 | 0 |
| | 3 | 20 | 20 | 0 | 0 |
| Transplanting | 0 | 8 | 10 | 5 | 10 |
| | 1 | 2 | 0 | 0 | 0 |
| | 2 | 7 | 5 | 0 | 0 |
| | 3 | 3 | 5 | 15 | 10 |
| Watering | 0 | 0 | 0 | 4 | 3 |
| | 1 | 0 | 1 | 8 | 0 |
| | 2 | 1 | 1 | 7 | 13 |
| | 3 | 19 | 18 | 1 | 4 |
| Weeding by hand | 0 | 1 | 5 | 0 | 0 |
| | 1 | 6 | 5 | 0 | 0 |
| | 2 | 10 | 5 | 0 | 0 |
| | 3 | 3 | 5 | 20 | 20 |

| | | Male | | Female | |
|---|---|---|---|---|---|
| | | Answered by male | Answered by female | Answered by male | Answered by female |
| Spraying | 0 | 0 | 0 | 17 | 18 |
| | 1 | 0 | 0 | 0 | 1 |
| | 2 | 1 | 0 | 2 | 1 |
| | 3 | 19 | 20 | 1 | 0 |
| Harvesting by hand | 0 | 0 | 0 | 0 | 0 |
| | 1 | 4 | 10 | 0 | 0 |
| | 2 | 10 | 7 | 1 | 0 |
| | 3 | 6 | 3 | 19 | 20 |
| Post-harvest (drying) | 0 | 0 | 0 | 3 | 1 |
| | 1 | 0 | 0 | 2 | 5 |
| | 2 | 1 | 0 | 10 | 14 |
| | 3 | 19 | 20 | 4 | 0 |
| Post-harvest (packing) | 0 | 0 | 0 | 2 | 3 |
| | 1 | 0 | 0 | 10 | 7 |
| | 2 | 0 | 0 | 5 | 9 |
| | 3 | 20 | 20 | 3 | 1 |
| Post-harvest (cleaning) | 0 | 0 | 1 | 4 | 3 |
| | 1 | 3 | 0 | 5 | 9 |
| | 2 | 1 | 0 | 6 | 6 |
| | 3 | 16 | 19 | 5 | 2 |
| Transportation (field to house) | 0 | 0 | 0 | 10 | 14 |
| | 1 | 0 | 0 | 9 | 6 |
| | 2 | 0 | 0 | 0 | 0 |
| | 3 | 20 | 20 | 1 | 0 |
| Transportation (house to market) | 0 | 0 | 0 | 20 | 20 |
| | 1 | 0 | 0 | 0 | 0 |
| | 2 | 0 | 0 | 0 | 0 |
| | 3 | 20 | 20 | 0 | 0 |
| Sales | 0 | 0 | 0 | 20 | 20 |
| | 1 | 0 | 0 | 0 | 0 |
| | 2 | 0 | 0 | 0 | 0 |

| | | Male | | Female | |
|---|---|---|---|---|---|
| | | Answered by male | Answered by female | Answered by male | Answered by female |
| | 3 | 20 | 20 | 0 | 0 |

### 4.2. Roles and Responsibility on House and Social Work

0:Not at all, 1: Support occasionally, 2 Support every time, 3: Mainly do

| | | Male | | Female | |
|---|---|---|---|---|---|
| | | Answered by male | Answered by female | Answered by male | Answered by female |
| Cooking | 0 | 16 | 20 | 0 | 0 |
| | 1 | 4 | 0 | 0 | 0 |
| | 2 | 0 | 0 | 0 | 0 |
| | 3 | 0 | 0 | 20 | 20 |
| Cleaning | 0 | 18 | 20 | 0 | 0 |
| | 1 | 2 | 0 | 0 | 0 |
| | 2 | 0 | 0 | 0 | 0 |
| | 3 | 0 | 0 | 20 | 20 |
| Fetching water | 0 | 19 | 20 | 0 | 0 |
| | 1 | 1 | 0 | 0 | 0 |
| | 2 | 0 | 0 | 0 | 0 |
| | 3 | 0 | 0 | 20 | 20 |
| Fetching firewood | 0 | 14 | 18 | 0 | 0 |
| | 1 | 3 | 0 | 0 | 0 |
| | 2 | 3 | 2 | 0 | 0 |
| | 3 | 0 | 0 | 20 | 20 |
| Washing clothes | 0 | 7 | 18 | 0 | 0 |
| | 1 | 5 | 0 | 0 | 0 |
| | 2 | 4 | 2 | 0 | 1 |
| | 3 | 4 | 0 | 20 | 19 |
| Caring for children (if you have) | 0 | 1 | 11 | 0 | 0 |
| | 1 | 10 | 7 | 0 | 0 |
| | 2 | 8 | 2 | 0 | 0 |
| | 3 | 1 | 0 | 20 | 20 |

| | | Male | | Female | |
|---|---|---|---|---|---|
| | | Answered by male | Answered by female | Answered by male | Answered by female |
| Caring for elder (if you have) | 0 | 0 | 3 | 0 | 0 |
| | 1 | 1 | 8 | 3 | 0 |
| | 2 | 10 | 9 | 2 | 0 |
| | 3 | 9 | 0 | 15 | 20 |
| Caring for sick (if you have) | 0 | 0 | 1 | 0 | 0 |
| | 1 | 2 | 2 | 6 | 4 |
| | 2 | 0 | 1 | 11 | 12 |
| | 3 | 18 | 16 | 3 | 4 |
| Caring for goat (if you have) | 0 | 2 | 7 | 2 | 2 |
| | 1 | 4 | 3 | 3 | 4 |
| | 2 | 2 | 3 | 7 | 3 |
| | 3 | 12 | 7 | 8 | 11 |
| Caring for cattle (if you have) | 0 | 0 | 4 | 0 | 0 |
| | 1 | 8 | 6 | 0 | 0 |
| | 2 | 2 | 2 | 5 | 4 |
| | 3 | 10 | 8 | 15 | 16 |
| Maintenance of house | 0 | 1 | 6 | 0 | 0 |
| | 1 | 3 | 4 | 4 | 1 |
| | 2 | 7 | 4 | 1 | 1 |
| | 3 | 9 | 6 | 15 | 18 |
| Networking with neighbors | 0 | 0 | 1 | 3 | 0 |
| | 1 | 0 | 3 | 14 | 14 |
| | 2 | 0 | 0 | 2 | 1 |
| | 3 | 20 | 16 | 1 | 5 |
| Attending community meeting | 0 | 0 | 0 | 15 | 19 |
| | 1 | 0 | 0 | 4 | 0 |
| | 2 | 0 | 0 | 1 | 1 |
| | 3 | 20 | 20 | 0 | 0 |

### 4.3. Access and Control

0: Not at all, 1: Only sometimes, 2: Often, 3: Mainly

| | | Access | | | | Control | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Male | | Female | | Male | | Female | |
| | | By male | By female | By male | By female | by male | by female | by male | y female |
| Farm land | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 17 | 20 |
| | 1 | 4 | 5 | 3 | 0 | 0 | 0 | 2 | 0 |
| | 2 | 3 | 4 | 5 | 7 | 0 | 0 | 0 | 0 |
| | 3 | 13 | 11 | 11 | 12 | 20 | 20 | 1 | 0 |
| House | 0 | 1 | 3 | 0 | 0 | 0 | 0 | 15 | 18 |
| | 1 | 9 | 10 | 1 | 0 | 0 | 0 | 2 | 2 |
| | 2 | 4 | 3 | 0 | 1 | 0 | 0 | 2 | 0 |
| | 3 | 6 | 3 | 19 | 19 | 20 | 20 | 1 | 0 |
| Farming tools | 0 | 0 | 0 | 4 | 2 | 0 | 0 | 17 | 19 |
| | 1 | 0 | 0 | 7 | 12 | 0 | 0 | 2 | 1 |
| | 2 | 2 | 1 | 5 | 5 | 0 | 0 | 1 | 0 |
| | 3 | 18 | 19 | 4 | 1 | 20 | 20 | 0 | 0 |
| Agri. machineries | 0 | 0 | 0 | 17 | 17 | 0 | 0 | 18 | 18 |
| | 1 | 0 | 0 | 2 | 3 | 0 | 0 | 2 | 1 |
| | 2 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 |
| | 3 | 20 | 20 | 0 | 0 | 20 | 20 | 0 | 0 |
| Farm input (seed, fertilizer, etc.) | 0 | 0 | 0 | 19 | 19 | 0 | 0 | 18 | 20 |
| | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 2 | 0 |
| | 2 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| | 3 | 20 | 20 | 0 | 0 | 20 | 20 | 0 | 0 |
| Cattle | 0 | 2 | 4 | 0 | 0 | 0 | 0 | 13 | 18 |
| | 1 | 6 | 6 | 2 | 2 | 3 | 0 | 1 | 2 |
| | 2 | 3 | 6 | 2 | 2 | 0 | 0 | 3 | 0 |
| | 3 | 9 | 4 | 16 | 16 | 17 | 20 | 3 | 0 |
| Goat | 0 | 1 | 7 | 1 | 3 | 1 | 2 | 12 | 18 |
| | 1 | 8 | 6 | 1 | 0 | 0 | 0 | 1 | 2 |
| | 2 | 0 | 2 | 5 | 3 | 0 | 0 | 7 | 0 |
| | 3 | 11 | 5 | 13 | 14 | 19 | 18 | 0 | 0 |
| Farm | 0 | 0 | 0 | 0 | 5 | 0 | 0 | 13 | 19 |

| | | Access | | | | Control | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Male | | Female | | Male | | Female | |
| | | By male | By female | By male | By female | by male | by female | by male | y female |
| products | 1 | 0 | 0 | 12 | 11 | 0 | 0 | 6 | 1 |
| | 2 | 0 | 1 | 8 | 3 | 0 | 0 | 1 | 0 |
| | 3 | 20 | 19 | 0 | 1 | 20 | 20 | 0 | 0 |
| House expenditure | 0 | 0 | 0 | 5 | 8 | 0 | 0 | 12 | 14 |
| | 1 | 0 | 0 | 4 | 1 | 0 | 0 | 2 | 2 |
| | 2 | 1 | 2 | 8 | 9 | 0 | 0 | 6 | 4 |
| | 3 | 19 | 18 | 3 | 2 | 20 | 20 | 0 | 0 |
| School fee | 0 | 0 | 0 | 16 | 17 | 0 | 0 | 17 | 19 |
| | 1 | 0 | 0 | 2 | 3 | 0 | 0 | 3 | 1 |
| | 2 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| | 3 | 20 | 20 | 1 | 0 | 20 | 20 | 0 | 0 |
| Cash/income | 0 | 0 | 0 | 16 | 18 | 0 | 0 | *16* | 19 |
| | 1 | 0 | 0 | 2 | 1 | 0 | 0 | *3* | 0 |
| | 2 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 1 |
| | 3 | 20 | 20 | 1 | 0 | *19* | 20 | 0 | 0 |

### 4.4. Gender Training

Have you ever received any training in gender?

| | Yes | No | Total |
|---|---|---|---|
| Male | 0 | 20 | 20 |
| Female | 0 | 20 | 20 |

### 4.5. Access to Agricultural Services

1) Have you ever get any agricultural extension services?

2) Experience on using market information and means to get information

| | Agri. services | | Marketing Information | | |
|---|---|---|---|---|---|
| | Yes | No | Yes | No | Means |
| Male | 0 | 20 | 2 | 18 | TV-1, No answer-1 |
| Female | 0 | 20 | 0 | 20 | |

# *Chapter 3*
# *Attachment*

*Attachment 3.1.1*
*Outline of RAJAMIIP*

# Attachment 3.1.1 Outline of RAJAMIIP

Rajasthan Minor Irrigation Improvement Project (RAJAMIIP) was designed based on the state's experience in implementing World Bank assisted projects viz. 'Dam Safety Project' and 'Rajasthan Water Sector Restructuring project' (RWSRP). The developmental objectives of RAJAMIIP were to increase the agricultural productivity in the state of Rajasthan with low rainfall and enhancing agriculture income and alleviating the poverty of farmer's community by rehabilitating existing minor irrigation infrastructure, by adopting modern water management techniques and agriculture practices with active participation of beneficiaries.

RAJAMIIP had been designed to: -

- improve the livelihood of farmers by increasing the reliability and the quantity of irrigation water during the Rabi-season (wet season) and by increasing the cultivation of high value cash crops,
- safe valuable water by introduction of modern cultivation and irrigation methods and by the cultivation of crops of low water demand,
- foster the formation of Water User Associations (WUAs) as a precondition for application of the Participatory Irrigation Management Act and the capacity building of WUA-functionaries to manage and administer the association as well as the infrastructure entrusted to them,
- reduce poverty of landless farmers by establishment of self-help groups (SHG) e.g. the introduction of micro-financing, cottage industries and other skill development, and
- reduce malaria in villages located near to surface water storage reservoirs by the introduction of fish species feeding on mosquito larvae.

The intervention comprises 5 major components:

- Civil works, to physically rehabilitate and improve existing irrigation infrastructure;
- Agricultural Extension, to introduce appropriate cultivation and irrigation methods and crops of low water demand but high market value;
- Capacity Building and Training to develop skills and knowledge of water users/farmers to manage and administer Water User Associations (WUAs), the future care takers of the irrigation infrastructure;
- Health precautions, to reduce the cases of waterborne diseases, mainly malaria by introduction of fish species eating mosquito larvae; and
- Pro Poor measures, to improve the livelihood of landless farmers by forming self-help groups, introducing micro-finance and other skill development programs.

RAJAMIIP was taken up with the assistance of JICA with an estimated cost as 6,122.9 million INR (JICA share as 4,814.5 million INR). The overall expenditure till the end of the project in July 2015 was 4,684.3 million INR, 76.5% of the budget (JICA share as 3,039.10 million INR, 63.1%).

The achievements under RAJAMIIP include: -

- After rehabilitation of the irrigation schemes water reached up to tail of the canal system;
- Formation and fostering of 393 WUAs had been done. Capacity building through extensive training at Irrigation Management & Training Institute (IMTI) and through NGO was carried out.
- Deployment of NGO was introduced in the state for the first time under the project. The NGO assisted in capacity building of the WUAs, formation of SHGs, meetings of Technical Supporting Groups (TSGs) etc.
- Although water courses are entirely an affair of the cultivators, in terms of construction, operation and maintenance, it is a known fact that most of the losses in irrigated agriculture occur within the tertiary system, i.e. in water courses and on irrigated fields. For that purpose GoR in agreement with JICA provided "corpus funds" to WUAs for financing improvements and rehabilitation of water courses. Initial length of 50 m of water courses was lined.

- The distribution system of all the 353 sub-projects have been handed over to WUAs
- 212 training courses were organized at IMTI Kota with 6,203 numbers of participants from WRD/ AD and WUAs
- 517 km of pipe lines were laid, sprinkler systems were installed on 252 ha and drip-systems on 166 ha. Although the introduction of micro irrigation system was meager, it is expected that innovative farmers will have a catalyst effect on fellow farmers and that the adoption of water saving irrigation methods will experience a boost.
- For sustainability of the WUAs, a sum of 2.00 *Lakh* (200 thousand) INR was provided to each WUA as corpus fund. The interest (fluctuated around 7.5 - 8.5%) accrued from the corpus fund is to be utilized by WUAs for O&M of the system. In addition to corpus fund, WUA office buildings dully furnished were also provided under the project.
- Technical Support Group (TSG) was conceptualized in the RAJAMIIP to provide technical guidance to the farmers/ Water User Group to enhance the agricultural productivity by efficient use of water resources, combined with advice on appropriate agricultural production methods, product handling and marketing. TSG was formed at three levels, at State, District and at WUA level.
- Agriculture extension component extending services including farmers training, WUA farmers training, on farm demonstrations on i) crop diversification, ii) integrated nutrient management and iii) integrated pest management, improved irrigation techniques such as sprinkler irrigation, drip irrigation and irrigation pipelines and improved farm implements.
- Construction of 21 numbers of hatcheries (8 mother hatcheries and 13 small hatcheries) for Gambusia fish to contain Malaria in the vicinity of sub project. This was on pilot basis only.
- Civil works component – the main component of the project, was designed for:(a) rehabilitation, renovation and up-gradation of tanks and distribution system of minor irrigation schemes selected through screening and appraisal based on criteria specified in Minutes of Discussion (MOD), and (b) related investigation and design work.
- Second stage screening of 647 sub-projects resulted in 393 sub-projects (CCA of 153,785ha) eligible which were proposed for formation of water user associations including capacity building and for participatory design and implementation of rehabilitation and improvement of irrigation infrastructure. Of the 393 sub-projects selected after second stage screening, 40 sub-projects did not qualify for physical rehabilitation of irrigation infrastructure and received only capacity building support under soft component. 353 sub-projects were identified to receive the full package of support, i.e. physical improvements as well as soft components such as capacity building and agricultural extension.

# *Attachment 3.2.1*
# *Lessons Learnt in RAJIAMIIP*

# Attachment 3.2.1 Lessons Learnt in RAJIAMIIP

## 1 Lesson Learnt in Irrigation Rehabilitation

The Minutes of Discussions (MOD) signed on 24 November 2004 with JICA contemplated completion of various activities involved under civil works component by December 2012. However there were several delays in appointment of the Engineering & Management Consultant, and NGO, all the activities under civil work component were delayed. Table 1 depicts the actual completion of various activities in comparison to the schedule contemplated.

**Table 1 List of Actual Completion of Various Activities**

| S. No | Description | Period as per MOD | | Actual | |
|---|---|---|---|---|---|
| | | From | To | From | To |
| 1 | Selection of Management & Engineering Consultant | Jan-05 | Oct-05 | Jan-07 | Mar-08 |
| 2 | Data collection for Second screening | Nov-05 | Sep-06 | May-08 | Sep-08 |
| 3 | Second screening | Feb-06 | Mar-07 | May-08 | Jan-09 |
| 4 | Establishment of SID Standard | Feb-06 | May-06 | Aug-08 | Dec-08 |
| 5 | Execution of SID | Jun-06 | Jan-08 | May-07 | Dec-11 |
| 6 | Appraisal of sub-projects | Oct-06 | Jan-08 | Nov-08 | Jan-12 |
| 7 | Tender & contract | Nov-06 | Dec-08 | Jun-09 | 14-Jun |
| 8 | Main civil works | Jun-07 | Dec-11 | Oct-09 | Jun-15 |

*Source: JICA Survey Team*

### 1.1 Survey, Investigation and Design Works

Survey, Investigation and Design (SID) work was awarded to different agencies for 309 sub-projects. SID works for remaining sub-projects were done by WRD itself. During SID work, WUAs were associated in diagnosing the deficiencies in the system. Similarly participatory approach was adopted during implementation of the rehabilitation works involving WUAs. To promote active involvement of the legally empowered WUAs, the rehabilitation of the water courses with a community contribution @15 % of the estimated cost under 222 sub-projects were completed.

Participatory irrigation management concept has been implemented in the project with encouraging results. Duly elected WUAs are in place and have taken over operation and management of system in some sub-project areas. However, certain lessons have been learnt which should be addressed and considered for the new project of similar nature.

i) SID works were designed to have active participation of WUAs, joint walk through survey to facilitate diagnostic analysis of the sub-project. However, due to initial delay in formation of WUAs, the involvement of WUAs was limited and only a section of beneficiaries were consulted.

ii) It was planned for the first time to carry out SID works through the agency of SID contractors (local consultants). There were limited numbers of SID contractor having expertise in water sector. Due to which, there had been abnormal delay in finalization of SID contracts. Eight contractors were awarded contracts for SID works of 309 sub-projects under 42 packages to be completed in 3 months. In the worst case only a contractor had 119 sub-projects to be completed in the 3 months. Even the selected SID contractors were not having sufficient resources and expertise to execute such type of works. This procedure was instrumental in not only delay in finalization of the DPRs of sub-projects and subsequent commencement of rehabilitation works. It is recommended that SID works should be carried out in stage-wised schedule with realistic work volumes under supervision of WRD staff.

iii) WRD is already equipped with suitable contract management system including general / technical specifications, conditions of the contracts, qualification criteria, registration of the contractors under different category. Finance department has delegated powers to approve contracts. The prevailing system could not be successfully implemented under RAJAMIIP due to modality of tendering under packages comprising of several sub-projects under one sub-division. This procedure developed caucus of contractors who manipulated to grab most of the contracts at very low prices up to 40 % below the estimated cost. This un-healthy practice of price dumping adversely affected: (i) quality of works executed, (ii) non-execution of essential but costlier component of work, (iii) delay in completion of works, (iv) rescinding of bulk of contracts and incomplete finalization of works due to failures on the part of the contractors, (v) cropping up of contractual disputes, and (vi) lack of proper contract management at divisional level.

It is recommended that (i) contracts of SID work should be awarded in consideration of capacity of the contractor, (ii) strict adherence to qualification criteria to avoid price dumping and awarding of contracts to competent contractors having required resources of manpower and equipments, and (iii) ensure competent contract management by strict compliance of the contract conditions during implementation of the contract.

## 1.2 Quality of Construction Works

The ultimate health of a constructed project during its operational phase depends largely on the quality achieved during its construction. The determined and co-operative pursuit of quality by the owner, the contractor, and the project design, supervision & quality control teams can surely produce a successful project. The team members, acting with skill, integrity, and responsibility, can surely fulfil contract commitments faithfully and competently. Thereby, producing the desired quality in the execution of works. Besides reviewing the physical and financial implementation progress in general, the E & M Consultant mainly focused on the review of the construction procedures being adopted on the execution of various works and the adequacy of quality control measures, conforming to technical specifications, being implemented towards achievement of acceptable construction quality. Several quality control and quality assurances associated deficiencies were noticed during field visit to the rehabilitation / modernization works, which required improvement. The rehabilitation works in 353 sub-projects constituted a huge job network involving almost all types of civil work. During project implementation, various quality control and quality assurances associated deficiencies related to (i) execution of works below specifications, (ii) major deviation from the approved design and drawings, (iii) deficient curing of concrete and masonry work, (iv) inadequate arrangements for watering and compaction of soils being laid for strengthening of embankments, and (v) inadequacy of quality control measures, conforming to technical specifications, were observed.

In RAJAMIIP final report, it is recommended, thereby, that in view of the immensity, complexity, and wide spread-out of the works proposed to be rehabilitated, and to ensure that these works are executed to good construction quality standards duly conforming to technical specifications; “third party quality control and quality assurance consultancy supervision” would be introduced.

## 1.3 Delay of Procurement for Evaluation and Monitoring Consultant

Engineering and Management (E & M) Consultant plays a major roll for construction management in selection of sub-project, appraisal of DPR of the sub-project, preparation of pre-qualification bid document, evaluation of bids, supervision of construction activity and quality assurance management, contract administration and monitoring. Under RAJAMIIP, selection and appointment consultant was delayed abnormally. This delay resulted in delayed implementation of rehabilitation works.

It is recommended that E & M consultant should be appointed in the initial period of planning of the project implementation.

# 2 Lesson Learnt in WUA Support

## 2.1 Delay of NGO Involvement

Farmer's participation in rehabilitation works can provide significant scope for building up sense of ownership and acquire experience for future maintenance work to be carried out by WUAs autonomously after transfer of management. The Minutes of Understandings (MOU) was signed between WUA and WRD for participatory rehabilitation of work at the commencement of the sub-project. Under RAJAMIIP WUAs had to participate: (i) joint walk through survey (ii) WUA's approval on plan and design and (iii) joint supervision on the construction. However during project implementation, the formation of WUAs as well as appointment of NGO was delayed, which resulted in lack of involvement at all stages of the rehabilitation.

Majority of farmers in all the systems are duly sensitized about importance of PIM, yet in absence of any resource facilitator for managing the institutions or coordinating authority, it cannot be said that system will function properly. The WUA functionaries would need intensive follow up and guidance, for at least one year to be watched and assisted after the system is formally handed over. Involvement of WUAs is to build up a sense of ownership, acquires expertise in water management and their sustainability with the project intervention.

It is recommended that WUAs should be formed before commencement of the planning for rehabilitation work and NGO should be appointed well in advance to provide support to WUAs and may be continued for at least one year after completion of the project for follow up.

## 2.2 Other Lessons in WUA Support

WUAs have been established under RAJAMIIP with the basic purpose of management, regulation, distribution, maintenance of irrigation under its jurisdiction to develop sense of ownership among the farmers. Participatory irrigation management (PIM) concept has been implemented in the project with encouraging results. Duly elected WUAs (400 in numbers) are in place and have taken over the operation and management of distributaries and minors of the canal system in the project area. Under RAJAMIIP, WUAs have been provided with well furnished offices. IMTI Kota was the nodal agency to impart training to WUA members. Additionally NGO also imparted capacity building training to WUAs. NGO organized meetings with WUAs on (i) orientation of members for sharing status of project as well as action plan, (ii) record keeping, (iii) pre & post cropping season and practice on water tariff collection, (iv) rehabilitation of water courses, (v) soil testing, (vi) transfer of management to WUAs for O & M, (vii) general body meeting, and (viii) W-TSG meeting. The training was organized at IMTI Kota as well as in the field (mainly by NGO).

Main learning from RAJAMIIP are as follows:

- WUAs are located in 26 districts and it is difficult for them to get full benefit from training at IMTI Kota which is located in one corner of the state. Efforts should be made to arrange /provide to large numbers of members /farmers training in field at different places to suit local requirement possibly by mobile training unit.
- NGO should also be provided extensive training at IMTI Kota before their field placement.
- WUAs should be formed on a wider range of activity rather confined to irrigated agriculture only. WUAs could become instrumental for marketing of inputs and products.
- For specialized job of water distribution, regulation & recording and realization of water tariff, and financial management, water masters should be provided to each WUA. The water masters can be trained for water management and computer at IMTI Kota.
- There is no obvious way of monitoring the future performance of WUAs for its long-term sustainability. WUAs lose their enthusiasm and lack resources to operate and maintain their systems and have not been suitably equipped to develop the required resources on their own. Substantial support and assistance is needed for some time to come to alleviate this risk.

# 3 Lessons Learnt in Farming Support

## 3.1 Basic objective of RAJAMIIP

The basic objective of RAJAMIIP was to increase the agricultural productivity by improving water management and modern agricultural practices thereby enhancing agricultural income and alleviating the poverty.

Agriculture extension component was a major activity that was coordinated and implemented by DoA. Financial provisions were insufficient in comparison to aspect of farming in the state.

Activities under agriculture extension component of the project were:

i) improve water management and agriculture practices, thereby enhancing income from agriculture and eventually alleviating poverty,
ii) improve water management through water saving and efficient management for increasing production per unit area, per unit time and per unit water,
iii) train WUA members and farmers to generate awareness for efficient use of irrigation water and bridge the existing yield gap through adoption of improved technologies,
iv) increase the overall system productivity by improving soil health through farm mechanization and efficient cropping system,
v) promote crop diversification, INM and IPM through crop demonstrations,
vi) increase farm income by initiating measures to minimize water requirement, cost of cultivation of crop through farm mechanization and use of water wise crops,
vii) promote 'water wise crops' for water saving, and
viii) promote organic farming, which is a holistic management system promoting and improving health of agro-system.

## 3.2 Poor Performance of Agricultural Support Services

### (1) DoA and Lined Departments

Agricultural support services have been provided to the farmers by DoA through extension support network. Agriculture support service were provided by department of agriculture (377 trainings for agriculture officers & 40,000 trainings for farmers, 110 exposure visits-cum-training programs for TSGs and farmers, 7,851on-farm demonstration on crop cultivation and water management). The WUA farmers trainings were conducted in various topics based on the need of the area and farmers. These achievements were based on the efforts of NGO staffs and understanding of some field staffs of DoA. However, most of beneficiaries were limited number of big farmers who had good connection to field staff. Poor farmers could not access to the information of training by DoA.

In RAJAMIIP, there were not enough provision of budget to DoA and lined departments. Therefore, they could not be motivated to support WUA of this project.

### (2) Technical Support Group (TSG)

Within this project, Technical Support Group (TSG) consisting of lined departments was established for farmer's training. Annually one state level workshop for RAJAMIIP was organized by State Institute of Agriculture Management, Durgapura, Jaipur to train DoA officers.

However, meetings of Technical Support Group (TSG) at WUA level and district level were not conducted regularly. Only once or twice a year, the meeting of this level was conducted. The attendance of various lined departments (irrigation, medical, cooperative and animal husbandry) is poor. Even most of farmers did not recognize the existence of TSG.

Though TSG is an ideal extension service, there was no collaboration among lined departments. To motivate them, project should have provided some incentives to DoA and lined departments.

### (3) Sprinklers and Drip Irrigation

233 sprinklers and 16 drip irrigation systems were provided under the project for demonstration purpose. Provision of pressurized methods of irrigation proved useful for the farmers for enhancing water use efficiency. However concept of water saving was not acquired by farmers fully. As a result,

some farmers expanded the irrigated area, but they did not care about more use of water than requirement.

For optimal use of irrigation water, water saving concept should have been promoted to upstream farmers to share excessive water to downstream farmers.

### 3.3 Land Utilization

The performance of land utilization was much better in the sub-project area in comparison to the control area where cropping intensity was only 135 % as against 157 % in the area where there has been project intervention under the project. In most of the areas of the project, the cropping intensity has increasing trend which clearly indicate a positive impact of the project interventions on the land and water resource utilization. A trend of shifting of area to use of water wise crops was observed in sub-projects having limited water availability for irrigation. To optimize the land use by water wise crops, upstream farmers need to save water so that both farmers could get benefit from the project. Both upstream and downstream farmers need to aware concept of water saving for optimal land use.

### 3.4 Use of Fertilizer

In some cases, awareness had developed among the farmers for judicious use of fertilizers based on soil test. Some farmers who have got soil test are now following integrated nutrient management and proper crop-rotation system instead of mono-cropping. Farmers had followed the improved technologies for crop production which resulted in increase in crop production. However the number who has soil health card is limited.

## 4 Lesson Learnt in Capacity Development / Human Resource Development

### 4.1 IMTI Training

The faculty of IMTI Kota comprises of departmental officers of Water Resource Department (WRD) and Department of Agriculture (DoA) and is posted for short duration. Most of the officers are not exposed to the principles of imparting knowledge about subject matters are not professional trainers. Curricula taught in IMTI are of general nature, which does not fulfil the requirement of institutional and technical and water management techniques. This type of training is not only ineffective but at time even counterproductive by imparting subject contrary to the curricula, goal and objective of the project. It is need of the time that IMTI should adopt latest techniques in agriculture, water management and irrigation practices and should employ/ hire professional trainers.

### 4.2 Community Organizers

In the RAJAMIIP, each Community Organizer (CO) was assigned 15 to 17 sub projects and that were too scattered in or across districts with large distances. Contacting 15 to 17 WUAs twice a month was a big task and because of this over burden the quality suffered. Therefore it is suggested that one CO should have only 5 to 7 sub projects, depending on the size of the irrigation project. In case of large and medium irrigation project one can think of only one project with one CO. This will ensure better capacity building of water users

### 4.3 Flexible Training Schedule

The capacity building/training, e.g. WUAs representative training, etc., have to be taken up in phases, which is always linked with completion of identified physical activities. It is imperative that the actual completion of the planned physical activities is often delayed on account of seasonality, administrative delays, procedures related to tendering and procurement, etc. Therefore, there has to be flexibility built in the activity plan to achieve the parameters of the desired capacity building and make the project a success.

## 5 Lesson Learnt in Administration and Management

Establishment of Well-organised Executing Body

According to objective of RAJAMIIP, role of WRD, DoH, and DoA is very significant but it has been experienced that there is lack of coordination which adversely affect the tempo of successful implementation of the project. Establishment of close relation among the line departments is required.

In RAJIAMIIP there were 2 main executive bodies, such as Steering Committee and PMU. No more than 8 Steering Committee Meetings of RAJAMIIP were held during project implementation period for 10 years, which cannot realise and maintain good relations among the line departments.

A Project Management Unit (PMU) was charged with the tasks of (i) overall project coordination, (ii) procurement management, and (iii) financial management, incl. checking of accounts and preparation of disbursement requests to JICA etc. However Sub-PMUs offices at WRD Zonal Offices as contemplated in the project had not been formed. The missing Sub-PMUs at zonal level were tried to be compensated by frequent meetings at zonal and divisional level and by involving the Superintending Engineers (as nodal officers) at circle level. The staff positions under PMU were not always fully occupied. Similarly at field level the availability of staff was too meager especially in the lower positions of Assistant/ Junior Engineers WRD-officers were generally insufficient in comparison to quantum of field work. This state of under-staffing has adverse impact on implementation of the project. The training events offered for WRD Officers at IMTI in adult skill enhancement in the use of PC and in word processing was not fully realized.

The establishment of three tiered Technical Support Groups (TSG) headed by DoA has been promoted by RAJAMIIP to create a forum enabling farmers to receive technical and agricultural information for water saving cultivation and increase in farm income through integrated advice by GoR agencies concerned.

However following issues of concern need to be addressed:

- Steering committee needs to be further strengthened and bi- monthly meetings need to be held for effective monitoring, review of progress and to redress the issues pertaining to project implementation.
- Regular review meetings at PMU level with all the line department and stack-holders should ensured.
- Only dedicated and experienced officers should be placed in PMU, Sub-PMU and at field level during project period and should have continuity.
- Field staff is generally overburdened with other activities and government programs due to which effective concentration on project activity and sense of ownership is lacking. This phenomenon is largely responsible for the substantial delays and lack of coordination in project execution. It would be suitable to have exclusive and selected staff for project implementation.
- Strengthening of infrastructure viz. computers and photo copiers' internet etc. is required.
- To ensure effective supervision and Quality Assurance Management (QAM) inspection vehicles with sufficient provision for POL should invariably be provided to PMU and field staff.
- The project involves implementation by various line departments; the proper coordination between these departments needs to be ensured.
- Financial management should be effective encompassing timely approvals, budget provisions, credit limit etc.
- Establishment of well-equipped M&E system to monitor project progress and assessment of impact is essentially required with dedicated staff.
- For sustainability of resources already built up, it is essential that water tariff should be revised regularly so as to meet the O & M cost. Pending the revision of water charges the state government should also supplement for O&M of canal system through various scheme.

# *Attachment 3.2.2*
# *Lessons Learnt from World Bank Assisted 'Rajasthan Water Sector Restructuring Project' (RWSRP)*

## Attachment 3.2.2 Lessons Learnt from World Bank Assisted 'Rajasthan Water Sector Restructuring Project' (RWSRP)

Throughout the project there was a marked reluctance to employ consultants, which resulted in delays, and in some cases failure, to obtain responsive bids for technically sophisticated contracts. Employment of specialist consultants can be essential for procurement of very technical contracts, such as for management information system (MIS), and supervisory control and data acquisition (SCADA). Ideally, project management consultants, assisting the PMU throughout the project, would provide these consultants.

- It is important to include water users/beneficiaries in the design and implementation of irrigation rehabilitation works to strengthen a feeling of ownership and impart skills in system management and conflict resolution. Training WUAs requires substantial long-term effort, much more than the limited training that was provided under the project. Under the RFMIS Act 2000, officials of WUAs are elected for five years so that education in the needs of their positions must be available when new untrained officials are elected. It is essential to have continuing provision for training WUA officials and WRD engineers.

- The sustainability of rehabilitated irrigation schemes depends on adequate needs-based budgetary support for O&M of the systems. The project failed to increase water charges and achieve the recovery of the full cost of O&M. The political difficulty of increasing charges makes it likely that pursuing these goals in the future would result in similar outcomes unless the Bank insists that water charges are increased before any future project went to the Board. A project that aims to encourage difficult political decisions by having a large construction component as an incentive needs to be strictly supervised so that, if the Bank really wants to achieve its objective, it suspends finance for the construction components to ensure that the non-construction components, such as increasing water charges and funding O&M, make satisfactory progress. As it is, the project spent about Rs 10,000/ha on rehabilitation of irrigation systems but now is spending a very small proportion (about 15%) of the required amount (assumed to average INR 569/ha/year) on O&M.

- Dam Safety should not be neglected. There is often a marked reluctance by senior engineers to accept that the original design parameters of dams that have operated for many decades may no longer be appropriate. Every dam should have a regular review of its safety by an independent dam specialist and the resulting recommendations must be implemented.

- An agriculture component in an irrigation project should be better integrated with demonstrations focusing on improved water use efficiency and targeted at WUAs and farmers.

# *Chapter 4*
# *Attachment*

# *Attachment 4.1*
# *Data Base for Sample DPRs*

## Attachment 4.1 Data Base for Sample DPRs

| | | | | | Majour works | | Cost | | | | | | | | | | 1.4 | 1.5 | 1.6 | 1.7 | 2.1.1 | 2.1.2 | 2.2.1 | 2.2.2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Dam | Canal | | | | | | | | | | | * | * | * | * | 2.1 | | * | 2.2 |
| | | | | | Dam Body | New lining | | | | | | | | | | | General | General | General | General | Location | Location | Location | Location |
| | | | | | Spill way | Rehabilitation of Lining/structure | Dam | | | | Canal | | | | | Total | cost as per DPR | Name of scheme | Period of construction | Last Rehabilitation | Scale of the rehabilitation | District | District | Tehsil/Taluka | Tehsil/Taluka |
| | | | | * need to | Earthen dam & Spill way | Rehabilitation & New lining | Concrete | Stone masonry | Earth work | Gate work | Concrete | Stone masonry | Earth work | Gate work | Structures and outlets | | | | | | | Code | Name | Code | Name |
| DPRSN | Dist SN | District | Name of Project | Category | NA | NA | Lac INR | Lac INR | Lac INR | Lac INR | Lac INR | Lac INR | Lac INR | Lac INR | Lac INR | Lac INR | Lac INR | Name | YYYY-YYYY | YYYY | Minor/Medium | Text | **Text** | Text | Text | |
| DPR001 | 01 | Ganganagar | Rehabilitation of Karniji Disty and its system | Medium | NA | Rehabilitation & New lining | | | | | 427 | 811 | 228 | 0 | 5 | 1,516 | 1,700 | Karniji Disty | | | | #REF! | #REF! | 0106 | #REF! |
| DPR002 | 01 | Ganganagar | Rehabilitation of H.H. Disty from RD 0 to 35.845 | Minor | NA | Rehabilitation & New lining | - | - | - | - | 380 | 32 | 75 | 0 | | 505 | 597 | | | | | #REF! | #REF! | 0102 | #REF! |
| DPR003 | 01 | Ganganagar | Rehabilitation of LNP Disty and its system | Minor | NA | Rehabilitation & New lining | - | - | - | - | 265 | 33 | 76 | 0 | 9 | 395 | 462 | | | | | #REF! | #REF! | 0102 | #REF! |
| DPR004 | 01 | Ganganagar | Rehabilitation of PS Disty and its system | Minor | NA | Rehabilitation & New lining | - | - | - | - | 227 | 29 | 85 | 0 | 15 | 366 | 377 | | | | | #REF! | #REF! | 0105 | #REF! |
| DPR005 | 01 | Ganganagar | Rehabilitation of Sameja Disty and its system | Minor | NA | Rehabilitation & New lining | - | - | - | - | 21 | 157 | 63 | 0 | 0 | 248 | 289 | | | | | #REF! | #REF! | 0105 | #REF! |
| DPR006 | 01 | Ganganagar | Rehabilitation of Farm Minor from RD 26.135 to 40.545 | Minor | NA | Rehabilitation & New lining | - | - | - | - | 115 | 19 | 31 | 0 | 0 | 170 | 197 | | | | | #REF! | #REF! | 0102 | #REF! |
| DPR007 | 01 | Ganganagar | Rehabilitation of PP minor from RD 0 to 13.323 | Minor | NA | Rehabilitation & New lining | - | - | - | - | 115 | 12 | 27 | 0 | 0 | 160 | 181 | Gang Canal project | | | | #REF! | #REF! | 0102 | #REF! |
| DPR008 | 02 | Hanumangarh | Rehabilitation of Karnisingh Distributary from Km 0 to 33.320. of Bhakra canal system | Minor | NA | Rehabilitation & New lining | - | - | - | - | 1,141 | 310 | 1,455 | 109 | 1,157 | 4,297 | 5,595 | | | | | #REF! | #REF! | 0202 | #REF! |
| DPR009 | 02 | Hanumangarh | Rehabilitation of Suratgarh Distributary from Km 0 to 33.528 & STG Ditch minor Km 0 to 12.192 of Bhakra canal system | Minor | NA | Rehabilitation & New lining | - | - | - | - | 1,532 | 329 | 926 | 0 | 549 | 3,436 | 4,992 | | | | | #REF! | #REF! | 0202 | #REF! |
| DPR010 | 02 | Hanumangarh | Rehabilitation of PBN Distributary from Km 0 to 34.217 of Bhakra canal system | Minor | NA | Rehabilitation & New lining | - | - | - | - | 2,156 | 0 | 1,025 | 0 | 609 | 3,904 | 5,228 | | | | | #REF! | #REF! | 0202 | #REF! |
| DPR011 | 02 | Hanumangarh | Rehabilitation of of fatehpura Distributary from Km 0 to 14.463, Chandurwali (CDR-I, CDR-II) distributory 0.00 to 12.207 & New Khara Km. 0.000 to 8.245 of Bhakra canal system | Minor | NA | Rehabilitation & New lining | - | - | - | - | 1,215 | 0 | 852 | 0 | 418 | 2,560 | 3,082 | Bhakra Canal Project | | | | #REF! | #REF! | 0202 | #REF! |
| DPR012 | 02 | Hanumangarh | Rehabilitation of Suratgarh Distributary from Km 33.528 to 48.768 & RP Mr. Km 0 to 5.26, KSR Mr. Km. 0 to 4.85 (SGM) Sardargarh Mr. km. 0 to 13.65 of Bhakra canal system | Minor | NA | Rehabilitation & New lining | - | - | - | - | 1,056 | 0 | 506 | 0 | 644 | 2,273 | 2,737 | | | | | #REF! | #REF! | 0202 | #REF! |
| DPR013 | 02 | Hanumangarh | Rehabilitation of Banwali Mr. Minor from Km 0 to 12.68 & Bhagsar (BGS) Mr. Km 0 to 11.0 Distributary from Km 0 to 14.463 , Chandurwali (CDR-I, CDR-II) distributory 0.00 to 12.207 & New Khara Km. 0.000 to 8.245 of Bhakra canal system | Minor | NA | Rehabilitation & New lining | - | - | - | - | 978 | 0 | 723 | 0 | 498 | 2,265 | 2,728 | | | | | #REF! | #REF! | 0202 | #REF! |
| DPR014 | 02 | Hanumangarh | Rehabilitation of kishanpura (KSP) Distributary from Km 0 to 20.787 & Siwala distributory 0.00 to 10.050 of Bhakra canal system | Minor | NA | Rehabilitation & New lining | - | - | - | - | 1,151 | 0 | 694 | 0 | 447 | 2,361 | 2,842 | | | | | #REF! | #REF! | 0202 | #REF! |
| DPR015 | 02 | Hanumangarh | Rehabilitation of NTW km 0 to 8.36, BKW km 0 to 3.40, KNJ Mr. Km 0 to 2.04, DBL Mr. Km 0 to 1.86 & SGM km 0 to 15.85 of Bhakra canal system | Minor | NA | Rehabilitation & New lining | - | - | - | - | 1,047 | 0 | 408 | 0 | 563 | 2,078 | 2,492 | Bhakra Canal Project | | | | #REF! | #REF! | 0202 | #REF! |
| DPR016 | 02 | Hanumangarh | Rehabilitation of PBN Distributary from Km 34.217 to 54.949 of Bhakra canal system | Minor | NA | Rehabilitation & New lining | - | - | - | - | 812 | 0 | 829 | 0 | 278 | 1,977 | 2,553 | Bhakra canal project | | | | #REF! | #REF! | 0202 | #REF! |
| DPR017 | 02 | Hanumangarh | Rehabilitation of Bhagsagar Sub Mr. (BGSM) Minor from km 0 to 3.20 & KRW km 0 to 14.00 & Sadulshahar Sub Mr. Km 0 to 2.26 of Bhakra canal system | Minor | NA | Rehabilitation & New lining | - | - | - | - | 619 | 0 | 379 | 0 | 517 | 1,561 | 1,881 | Bhakra canal project | | | | #REF! | #REF! | 0202 | #REF! |
| DPR018 | 02 | Hanumangarh | Rehabilitation of of Sabuna Distributary from Km 0 to 17.777 & Nagrana distributory 0.00 to 6.614 of Bhakra canal system | Minor | NA | Rehabilitation & New lining | - | - | - | - | 940 | 0 | 256 | 0 | 262 | 1,501 | 1,807 | | | | | #REF! | #REF! | 0202 | #REF! |
| DPR019 | 02 | Hanumangarh | Rehabilitation of of Manaksar Distributary from Km 0 to 14.264 & Daulatpura Minor 0.00 to 7.103 of Bhakra canal system | Minor | NA | Rehabilitation & New lining | - | - | - | - | 731 | 0 | 248 | 0 | 471 | 1,494 | 1,799 | | | | | #REF! | #REF! | 0202 | #REF! |
| DPR046 | 02 | Hanumangarh | Rehabilitation of Hanumangarh Distributary from km 0 to 20.269 (Tail) of Bhakra canal system | Minor | NA | Rehabilitation & New lining | | | | | 915 | 0 | 353 | 0 | 590 | 1,914 | 2,285 | Rehabilitation of Hanumangarh Distributary from km 0 to 20.269 (Tail) of Bhakra canal | | | | #REF! | #REF! | 0202 | #REF! |
| DPR020 | 06 | Alwar | Rehabilitation of Mansarovar Irrigation Project | Minor | Earthen dam & Spill wa | Rehabilitation & New lining | 1 | 17 | 54 | 2 | 46 | 74 | 13 | 0 | 18 | 228 | 239 | Mansarovar Irrigation Project | | | | #REF! | #REF! | 0402 | #REF! |
| DPR021 | 07 | Bharatpur | Rehabilitation Bharatpur Feeder System | Feeder | NA | Rehabilitation & New lining | | | | | 3,480 | 4 | 402 | 0 | 0 | 3,963 | 4,465 | | | | | #REF! | #REF! | 0704 | #REF! |
| DPR022 | 07 | Bharatpur | Renovation of pai distributory (Gurgaon Main Canal) | Minor | NA | Rehabilitation & New lining | | | | | 415 | 1,583 | 263 | 0 | 68 | 2,375 | 2,800 | | | | | #REF! | #REF! | | #REF! |
| DPR023 | 07 | Bharatpur | Rehabilitation of Bundh Baretha Medium Irrigation Project | Medium | Earthen dam & Spill wa | Rehabilitation & New lining | | | | | 554 | 90 | 102 | 0 | 44 | 804 | 1,230 | | | | | #REF! | #REF! | | #REF! |
| DPR024 | 07 | Bharatpur | Renovation of Hatheen Minor (Gurgaon Main Canal) | Minor | NA | Rehabilitation & New lining | | | | | 200 | 610 | 105 | 0 | 4 | 938 | 1,130 | | | | | #REF! | #REF! | | #REF! |
| DPR025 | 07 | Bharatpur | Renovation of Nonera Minor (Gurgaon Main Canal) | Minor | NA | Rehabilitation & New lining | | | | | 81 | 352 | 45 | 0 | 4 | 491 | 594 | | | | | #REF! | #REF! | | #REF! |
| DPR026 | 07 | Bharatpur | Renovation of Kanwadi Minor (Gurgaon Main Canal) | Minor | NA | Rehabilitation & New lining | | | | | 77 | 301 | 31 | 0 | 1 | 418 | 504 | Kanwadi Minor (Gurgaon Main Canal) | | | | #REF! | #REF! | 0702 | #REF! |
| DPR027 | 07 | Bharatpur | Renovation of Gaonri Minor (Gurgaon Main Canal) | Minor | NA | Rehabilitation & New lining | | | | | 29 | 139 | 27 | 0 | 1 | 200 | 242 | Kanwadi Minor (Gurgaon Main Canal) | | | | #REF! | #REF! | 0702 | #REF! |
| DPR028 | 07 | Bharatpur | Renovation of Kirawta Minor (Gurgaon Main Canal) | Minor | NA | Rehabilitation & New lining | | | | | 33 | 133 | 18 | 0 | 2 | 189 | 228 | Kirawta Minor (Gurgaon Main Canal) | | | | #REF! | #REF! | 0702 | #REF! |
| DPR029 | 07 | Bharatpur | Renovation of Nagla Zalim Singh Minor (Gurgaon Main Canal) | Minor | NA | Rehabilitation & New lining | | | | | 28 | 120 | 30 | 1 | 2 | 184 | 223 | Nagla Zalim Sing minor (Gurgaon main canal) | | | | #REF! | #REF! | 0702 | #REF! |
| DPR030 | 09 | Karauli | Rehabilitation of Canal System of Kalisil Dam | Medium | Earthen dam & Spill wa | Rehabilitation & New lining | 117 | 49 | 0 | 0 | 625 | 0 | 140 | 14 | 204 | 1,172 | 1,329 | Kalisil Medium Irrigation Project | | | | #REF! | #REF! | 0906 | #REF! |
| DPR031 | 10 | Sawai Madhopur | Rehabilitation of Dheel Irrigation Project | Medium | Earthen dam & Spill wa | Rehabilitation & New lining | | 62 | 108 | 2 | 1,930 | 138 | 755 | 15 | 140 | 3,212 | 3,836 | Dheel Irrigation Project | | | | #REF! | #REF! | 1003 | #REF! |
| DPR032 | 10 | Sawai Madhopur | Rehabilitation of Surwal Irrigation Project | Medium | Earthen dam & Spill wa | Rehabilitation & New lining | 22 | 48 | 85 | 0 | 826 | 9 | 312 | 0 | 25 | 1,354 | 1,572 | Surwal Irrigation Project | | | | #REF! | #REF! | 1006 | #REF! |
| DPR033 | 10 | Sawai Madhopur | Rehabilitation of Baniyawala Irrigation Project | Minor | Earthen dam & Spill wa | Rehabilitation & New lining | 6 | 3 | 61 | 0 | 29 | 0 | 6 | 8 | 6 | 123 | 150 | Baniyawala Irrigation Project | | | | #REF! | #REF! | 1001 | #REF! |
| DPR034 | 11 | Dausa | Rehabilitation of Sintholi Minor Irrigation Project | Minor | Dam Body | Rehabilitation & New lining | 4 | 23 | 5 | 0 | 66 | 15 | 77 | 5 | 5 | 204 | 247 | Rehabilitation of Sintholi Minor Irrigation Project | | | | #REF! | #REF! | 1105 | #REF! |
| DPR035 | 13 | Sikar | Rehabilitation of Hardas ka bass Bund II Irrigation Project | Minor | Earthen dam & Spill wa | Rehabilitation & New lining | 15 | 55 | 63 | 0 | 4 | 5 | 7 | 1 | 0 | 153 | 193 | Hardas ka bass Bund II Irrigation Project | | | | #REF! | #REF! | 1305 | #REF! |

| | 2.3 | 2.4 | 2.5 | 2.6 | 2.7.1 | 2.7.2 | 2.7.3 | 2.8.1 | 2.8.2 | 2.8.3 | 2.9 | 3.1 | 3.2.1 | 3.2.2 | 3.3.1 | 3.3.2 | 3.4.1 | 3.4.2 | 3.5.1 | 3.5.2 | 3.5.3 | 3.5.4 | 3.5.5 | 3.5.6 | 3.5.7 | 3.5.8 | 4.1.1 | 4.1.2 | 4.1.3 | 4.2.1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 2.3 | 2.3 | 2.4 | 2.5 | 2.6.1 | 2.6.2 | 2.6.3 | 2.6.4 | 2.6.5 | 2.6.6 | * | * | 3.1 | 3.1 | 3.2 | 3.2 | 3.3 | 3.3 | 3.4.0 | 3.4.0 | 3.4.1 | 3.4.1 | 3.4.2 | 3.4.2 | 3.4.3 | 3.4.3 | 4.1.1 | 4.1.2 | 4.1.3 | 4.2.1 |
| | Location | Location | Location | Location | Location | Location | Location | Location | Location | Location | Location | Socio-Economic | Socio-Economic | Socio-Economic | Socio-Economic | Socio-Economic | Socio-Economic | Socio-Economic | Socio-Economic | Socio-Economic | Socio-Economic | Socio-Economic | Socio-Economic | Socio-Economic | Socio-Economic | Socio-Economic | Hydrological data | Hydrological data | Hydrological data | Hydrological data |
| | River | Tributary | Location of Dam/diversion structure | Name of River Basin | Longtitude | Longtitude | Longtitude | Latitude | Latitude | Latitude | Coordination | General | Benefit District | Benefit District | Income | Income | Land holdings | Land holdings | Population benefited | Population benefited | benefited | benefited | benefited | benefited | benefited | benefited | Catchment area at dam site | Catchment area at dam site | Catchment area at dam site | Rainfall |
| | | | | | Degree | Minutes | Seconds | Degree | Minutes | Seconds | | | Code | Name | Original | Reviced | Original | Reviced | Original Total | Reviced Total | Original Scheduled cast | Reviced Scheduled cast | Original Schedule Tribe | Reviced Schedule Tribe | Original Other backward castes | Reviced Other backward castes | Total | Free | Intercepted | Original Max. annual |
| DPRSN | Text | Text | Text | Basin | Degree | Minutes | Seconds | Degree | Minutes | Seconds | Text | Text | Text | Text | Lacs INR | Lacs INR | ha | ha | nos | nos | nos | nos | nos | nos | nos | nos | km2 | km2 | km2 | mm |
| DPR001 | Sutlej | BLANK | Harike Barrage near Amritssar sahib | | 76 | 26 | 0 | 31 | 24 | 39 | 31.41083N 76.43333E | Source of livelihood for 2 lac Household, 5 lac population for irrigation and 15 lac population for drinking water | 01 | #REF! | BLANK | | 2.3 | | 200000 | 200000 | 35000 | 35000 | 8000 | 8000 | 80000 | 80000 | NA | NO ITEM | NO ITEM | 550 |
| DPR002 | Sutlej | | Harike Barrage near Amritsar sahib | Sutlej | 76 | 26 | 0 | 31 | 24 | 39 | 31.41083N 76.43333E | | Sri Ganganagar | Sri Ganganagar | Blank | | 2.3 | N.A. | 35000 | 50000 | 5000 | Uncleared | 1000 | Uncleared | 15000 | Uncleared | N.A. | N.A. | N.A. | 550 |
| DPR003 | Sutlej | | Harike Barrage near Amritsar sahib | Sutlej | 76 | 26 | 0 | 31 | 24 | 39 | 31.41083N 76.43333E | | Sri Ganganagar | Sri Ganganagar | Blank | | 2.3 | N.A. | 50000 | 125000 | 12000 | Uncleared | 1000 | Uncleared | 15000 | Uncleared | N.A. | N.A. | N.A. | 550 |
| DPR004 | Sutlej | | Harike Barrage near Amritsar sahib | Sutlej | 76 | 26 | 0 | 31 | 24 | 39 | 31.41083N 76.43333E | | Sri Ganganagar | Sri Ganganagar | Blank | | 2.3 | N.A. | 50000 | 125000 | 12000 | Uncleared | 1000 | Uncleared | 15000 | Uncleared | N.A. | N.A. | N.A. | 550 |
| DPR005 | Sutlej | | Harike Barrage near Amritsar sahib | Sutlej | 76 | 26 | 0 | 31 | 24 | 39 | 31.41083N 76.43333E | | Sri Ganganagar | Sri Ganganagar | Blank | | 2.3 | Uncleared | 50000 | 125000 | 12000 | Uncleared | 1000 | Uncleared | 15000 | Uncleared | N.A. | N.A. | N.A. | 550 |
| DPR006 | Sutlej | | Harike Barrage near Amritsar sahib | Sutlej | 76 | 26 | 0 | 31 | 24 | 39 | 31.41083N 76.43333E | | Sri Ganganagar | Sri Ganganagar | Blank | | 2.3 | Uncleared | 50000 | 35000 | 5000 | Uncleared | 1000 | Uncleared | 15000 | Uncleared | N.A. | N.A. | N.A. | 550 |
| DPR007 | Sutlej | | Harike Barrage near Amritsar sahib | Sutlej | | | | 76 | 26 | 0 | 76.43333N 0.00000E | | 01 | #REF! | 0.5 | | 2.3 | NO ITEM | 35000 | NO ITEM | | 5000 | NO ITEM | 1000 | NO ITEM | 15000 | NO ITEM | NA | NA | NA | 550 |
| DPR008 | Sutlej | | Harike Barrage near Amritsar Sahib | Sutlej | 76 | 26 | 0 | 31 | 24 | 39 | 31.41083N 76.43333E | | Hanumangarh & Sri Ganganagar | Hanumangarh & Sri Ganganagar | Blank | | 2.3 | 2.3 | 500000 | Blank | Blank | Blank | Blank | Blank | Blank | Blank | N.A. | N.A. | N.A. | 550 |
| DPR009 | Sutlej | | Harike Barrage near Amritsar Sahib | Sutlej | 76 | 26 | 0 | 31 | 24 | 39 | 31.41083N 76.43333E | | Hanumangarh & Sri Ganganagar | Hanumangarh & Sri Ganganagar | Blank | | 2.3 | 2.3 | 500000 | Blank | Blank | Blank | Blank | Blank | Blank | Blank | N.A. | N.A. | N.A. | 550 |
| DPR010 | Sutlej | | Harike Barrage near Amritsar Sahib | Sutlej | 76 | 26 | 0 | 31 | 24 | 39 | 31.41083N 76.43333E | | Hanumangarh & Sri Ganganagar | Hanumangarh & Sri Ganganagar | Blank | | 2.3 | 2.3 | 500000 | Blank | Blank | Blank | Blank | Blank | Blank | Blank | N.A. | N.A. | N.A. | 550 |
| DPR011 | Sutlej | | Harike Barrage near Amritsar sahib | Sutlej | | | | 76 | 26 | 0 | 76.43333N 0.00000E | | 02 | #REF! | | | 2.3 | NO ITEM | 50000 | NO ITEM | | | | | | | NA | NA | NA | 550 |
| DPR012 | Sutlej | | Harike Barrage near Amritsar Sahib | Sutlej | 76 | 26 | 0 | 31 | 24 | 39 | 31.41083N 76.43333E | | Hanumangarh & Sri Ganganagar | Hanumangarh & Sri Ganganagar | Blank | | 2.3 | 2.3 | 500000 | Blank | Blank | Blank | Blank | Blank | Blank | Blank | N.A. | N.A. | N.A. | 550 |
| DPR013 | Sutlej | | Harike Barrage near Amritsar Sahib | Sutlej | 76 | 26 | 0 | 31 | 24 | 39 | 31.41083N 76.43333E | | Hanumangarh & Sri Ganganagar | Hanumangarh & Sri Ganganagar | Blank | | 2.3 | 2.3 | 500000 | Blank | Blank | Blank | Blank | Blank | Blank | Blank | N.A. | N.A. | N.A. | 550 |
| DPR014 | Sutlej | | Harike Barrage near Amritsar Sahib | Sutlej | 76 | 26 | 0 | 31 | 24 | 39 | 31.41083N 76.43333E | | Hanumangarh & Sri Ganganagar | Hanumangarh & Sri Ganganagar | Blank | | 2.3 | 2.3 | 500000 | Blank | Blank | Blank | Blank | Blank | Blank | Blank | N.A. | N.A. | N.A. | 550 |
| DPR015 | Sutlej | | Harike Barrage near Amritsar sahib | Sutlej | | | | 76 | 26 | 0 | 76.43333N 0.00000E | | 02 | #REF! | | | 2.3 | | 500000 | | | | | | | | NA | NA | NA | 550 |
| DPR016 | Sutlej | | Harike Barrage near Amritsar sahib | Sutlej | | | | 76 | 26 | 0 | 76.43333N 0.00000E | | 02 | #REF! | | | 2.3 | | 500000 | | | | | | | | NA | NA | NA | 550 |
| DPR017 | Sutlej | | Harike Barrage near Amritsar sahib | Sutlej | | | | 76 | 26 | 0 | 76.43333N 0.00000E | | 02 | #REF! | | | 2.3 | | 500000 | | | | | | | | NA | NA | NA | 550 |
| DPR018 | Sutlej | | Harike Barrage near Amritsar Sahib | Sutlej | 76 | 26 | 0 | 31 | 24 | 39 | 31.41083N 76.43333E | | Hanumangarh and Sri Ganganagar | Hanumangarh and Sri Ganganagar | Blank | | 2.3 | 2.3 | 500000 | 500000 | Blank | Blank | Blank | Blank | Blank | Blank | N.A. | Uncleared | Uncleared | 550 |
| DPR019 | Sutlej | | Harike Barrage near Amritsar Sahib | Sutlej | 76 | 26 | 0 | 31 | 24 | 39 | 31.41083N 76.43333E | | Hanumangarh and Sri Ganganagar | Hanumangarh and Sri Ganganagar | Blank | | 2.3 | 2.3 | 500000 | 500000 | Blank | Blank | Blank | Blank | Blank | Blank | N.A. | Uncleared | Uncleared | 550 |
| DPR046 | Sutlej | Sutlej | Harike Barrage near Amritsar sahib | Sutlej | 76 | 26 | 0 | 31 | 24 | 39 | 31.41083N 76.43333E | | 02 | #REF! | BLANK | BLANK | 2.3 | BLANK | 500000 | BLANK | BLANK | BLANK | BLANK | BLANK | BLANK | BLANK | NA | NA | NA | 550 |
| DPR020 | Bhigani Nalla | | Tehalla | Banganga | | | | 76 | 54 | 0 | 76.90000N 0.00000E | | 06 | #REF! | BLANK | | NOT CLEAR | | 1700 | 1700 | - | - | 1200 | 1200 | 500 | 500 | 9320 | NO ITEM | NO ITEM | 1073 |
| DPR021 | Yamuna | | N.A. | Yamuna River Basin | 77 | 29 | 29 | 27 | 23 | 15 | 27.38750N 77.49139E | | Bharatpur | Bharatpur | Blank | | 1.2 | 1.2 | 100000 | 100000 | 30000 | 30000 | 15000 | 15000 | 30000 | 30000 | 181.3 | Uncleared | Uncleared | 822 |
| DPR022 | | | | | | | | | | | 0.00000N 0.00000E | | | #REF! | | | | | | | | | | | | | | | | |
| DPR023 | | | | | | | | | | | 0.00000N 0.00000E | | | #REF! | | | | | | | | | | | | | | | | |
| DPR024 | | | | | | | | | | | 0.00000N 0.00000E | | | #REF! | | | | | | | | | | | | | | | | |
| DPR025 | | | | | | | | | | | 0.00000N 0.00000E | | | #REF! | | | | | | | | | | | | | | | | |
| DPR026 | Yanmuna | Ganga Basin | Al Okhla | | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | #VALUE! | | 07 | #REF! | BLANK | | 1-3 | | 7000 | 7000 | 1000 | 1000 | - | - | 1500 | 3500 | Canal is based on Yamuna water, no dam is in the | Canal is based on Yamuna water, no dam is in the | Canal is based on Yamuna water, no dam is in the | 1130 |
| DPR027 | Yanmuna | Ganga Basin | Al Okhla | | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | #VALUE! | | 07 | #REF! | | | 1-3 | | 3500 | 7500 | 500 | 1200 | - | - | 1600 | 3600 | Canal is based on Yamuna water, no dam is in the | Canal is based on Yamuna water, no dam is in the | Canal is based on Yamuna water, no dam is in the | 1130 |
| DPR028 | Yanmuna | Ganga Basin | Al Okhla | | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | #VALUE! | | 07 | #REF! | | | 1-3 | | 3000 | 5000 | 500 | 1000 | - | - | 2500 | 4000 | Canal is based on Yamuna water, no dam is in the | Canal is based on Yamuna water, no dam is in the | Canal is based on Yamuna water, no dam is in the | 1130 |
| DPR029 | Yanmuna | Ganga Basin | Al Okhla | | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | #VALUE! | | 07 | #REF! | | | 1-3 | | 2000 | 6000 | 300 | 900 | - | - | 1200 | 3500 | Canal is based on Yamuna water, no dam is in the | Canal is based on Yamuna water, no dam is in the | Canal is based on Yamuna water, no dam is in the | 1130 |
| DPR030 | Kalisil Banas | Chambal | Near village Sapotra | Chambal | 76 | 46 | 0 | 26 | 16 | 15 | 26.27083N 76.76667E | | 09 | #REF! | BLANK | | BLANK | BLANK | NOT CLEAR | NOT CLEAR | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEAR | 331.52 | 331.52 | | 1519 |
| DPR031 | Dheel | Banas | Near village Tapur | | 76 | 7 | 0 | 26 | 13 | 0 | 26.21667N 76.11667E | | 10 | #REF! | 1.93 | | 1-4 | | 72000 | 72000 | 9000 | 9000 | 45000 | 45000 | 18000 | 18000 | 688.93 | NO ITEM | NO ITEM | 1271 |
| DPR032 | Gambhir | Chambal | Near village Surwal Tehsil Sawai Madhpur | Gambhir Banas | 76 | 20 | 30 | 26 | 4 | 30 | 26.07500N 76.34167E | | 10 | #REF! | BLANK | | 2-4 | 1-1.5 | 28000 | 55000 | 8000 | 16000 | 16000 | 32000 | 4000 | 7000 | NOT CLEAR | NOT CLEAR | NOT CLEAR | 1214.09 |
| DPR033 | Jeewad | Banas | Near village Udai Kalan | Banas | 76 | 30 | 44 | 26 | 33 | 5 | 26.55139N 76.51222E | | 10 | #REF! | 0.03 | 0.04 | 1-2 | 1-2 | 1625 | 1625 | 190 | 190 | 10 | 10 | 1425 | 1425 | | 15.54 | | 1224 |
| DPR034 | Local Nalla | | Near village Sintholi | Chambal | 76 | 25 | 0 | 26 | 32 | 10 | 26.53611N 76.41667E | | 11 | #REF! | BLANK | BLANK | NOT CLEAR | NOT CLEAR | 2408 | 2408 | 388 | 388 | 1682 | 1682 | 338 | 338 | | 23.04 | 23.04 | 1128 |
| DPR035 | Local Nalla | | Near village Hardas Ka Bass | Sabi | 75 | 46 | 15 | 27 | 31 | 15 | 27.52083N 75.77083E | | 13 | #REF! | BLANK | BLANK | BLANK | BLANK | 8 | 8 | BLANK | BLANK | BLANK | BLANK | BLANK | BLANK | 45.25 | BLANK | BLANK | 1033 |

| | 4.2.2<br>4.2.1 | 4.2.3<br>4.2.2 | 4.2.4<br>4.2.2 | 4.2.5<br>4.2.3 | 4.2.6<br>4.2.3 | 4.2.7<br>4.2.4 | 4.2.8<br>4.2.4 | 4.2.9<br>4.2.4 | 4.2.10<br>4.2.4 | 4.4.1<br>4.3.1 | 4.4.2<br>4.3.1 | 4.4.3<br>4.3.2 | 4.4.4<br>4.3.2 | 4.4.5<br>4.3.3 | 4.4.6<br>4.3.3 | 4.4.7<br>4.3.4 | 4.4.8<br>4.3.4 | 4.4.9<br>4.3.4 | 4.4.10<br>4.3.4 | 4.5.1<br>4.4.0 | 4.5.2<br>4.4.0 | 5.1.1<br>5.1.1 | 5.1.2<br>5.1.2 | 5.2.1<br>5.2.1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Hydrological data | Hydrological data | Hydrological data | Hydrologic al data | Hydrologic al data | Hydrological data | Hydrological data | Hydrological data | Hydrological data | Hydrological data | Hydrological data | Hydrological data | Hydrological data | Hydrological data | Hydrological data | Hydrological data | Hydrological data | Hydrological data | Hydrological data | Hydrological data | Hydrological data | Water Utilization | Water Utilization | Water Utilization |
| | Rainfall | Rainfall | Rainfall | Rainfall | Rainfall | Rainfall | Rainfall | Rainfall | Rainfall | Annual runoff | Annual runoff | Annual runoff | Annual runoff | Annual runoff | Annual runoff | Annual runoff | Annual runoff | Annual runoff | Annual runoff | Design Flood | Design Flood | Reservation of upstream use | Reservation of upstream use | Reservation of downstream use |
| | Reviced Max. annual | Original min. annual | Reviced min. annual | Original mean annual | Reviced mean annual | Original 75% dependable annual rainfall | Original 75% dependable annual rainfall | Reviced 50% dependable annual rainfall | Reviced 50% dependable annual rainfall | Original mean annual | Reviced mean annual | Original Max. annual | Reviced Max. annual | Original min. annual | Reviced min. annual | Original 75% dependable annual runoff | Reviced 75% dependable annual runoff | Original 50% dependable annual runoff | Reviced 50% dependable annual runoff | Original | Proposed | Present | Proposed | Present |
| DPRSN | mm | mm | mm | mm | mm | mm | mm | mm | mm | Million m3 | Million m3 | Million m3 | Million m3 | Million m3 | Million m3 | Million m3 | Million m3 | Million m3 | Million m3 | m3/s | m3/s | Million m3 | Million m3 | Million m3 |
| DPR001 | NA | | 80 | NA | 290 | NA | 200 | 200 | | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NOT CLEAR | NA | NA | NA | NA |
| DPR002 | N.A. | | 80 | N.A. | 290 | N.A. | 200 | N.A. | Uncleared | Uncleared | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | Uncleared | Uncleared | 84.9 | N.A. | N.A. | N.A. | N.A. |
| DPR003 | N.A. | | 80 | N.A. | 290 | N.A. | 200 | N.A. | Uncleared | Uncleared | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | Uncleared | Uncleared | 84.9 | N.A. | N.A. | N.A. | N.A. |
| DPR004 | N.A. | | 80 | N.A. | 290 | N.A. | 200 | N.A. | Uncleared | Uncleared | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | Uncleared | Uncleared | 84.9 | N.A. | N.A. | N.A. | N.A. |
| DPR005 | N.A. | | 80 | N.A. | 290 | N.A. | 200 | N.A. | Uncleared | Uncleared | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | Uncleared | Uncleared | 84.9 | N.A. | N.A. | N.A. | N.A. |
| DPR006 | N.A. | | 80 | N.A. | 290 | N.A. | 200 | N.A. | Uncleared | Uncleared | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | Uncleared | Uncleared | 84.9 | N.A. | N.A. | N.A. | N.A. |
| DPR007 | NO ITEM | | 80 | NO ITEM | 290 | NO ITEM | 200 | NO ITEM | NO ITEM | NO ITEM | NOT CLEAR | NOT CLEAR | NOT CLEAR | NOT CLEAR | NOT CLEAR | NOT CLEAR | NOT CLEAR | NOT CLEAR | NOT CLEAR | NOT CLEAR | NOT CLEAR | NOT CLEAR | NA | NA | NA |
| DPR008 | N.A. | | 80 | N.A. | 290 | N.A. | 200 | N.A. | Uncleared | Uncleared | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | Uncleared | Uncleared | | 1216.9 | 1216.9 | N.A. | N.A. | N.A. |
| DPR009 | N.A. | | 80 | N.A. | 290 | N.A. | 200 | N.A. | Uncleared | Uncleared | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | Uncleared | Uncleared | | 1216.9 | 1216.9 | N.A. | N.A. | N.A. |
| DPR010 | N.A. | | 80 | N.A. | 290 | N.A. | 200 | N.A. | Uncleared | Uncleared | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | Uncleared | Uncleared | | 1216.9 | 1216.9 | N.A. | N.A. | N.A. |
| DPR011 | 550 | | 80 | 80 | 290 | 290 | 200 | 200 | NO ITEM | NO ITEM | BLANK | BLANK | BLANK | BLANK | BLANK | BLANK | BLANK | BLANK | BLANK | BLANK | | 1217.624421 | NO ITEM | NA | NA | NA |
| DPR012 | N.A. | | 80 | N.A. | 290 | N.A. | 200 | N.A. | Uncleared | Uncleared | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | Uncleared | Uncleared | | 1216.9 | Uncleared | N.A. | N.A. | N.A. |
| DPR013 | N.A. | | 80 | N.A. | 290 | N.A. | 200 | N.A. | Uncleared | Uncleared | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | Uncleared | Uncleared | | 1216.9 | Uncleared | N.A. | N.A. | N.A. |
| DPR014 | N.A. | | 80 | N.A. | 290 | N.A. | 200 | N.A. | Uncleared | Uncleared | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | Uncleared | Uncleared | | 1216.9 | Uncleared | N.A. | N.A. | N.A. |
| DPR015 | NO ITEM | | 80 | NO ITEM | 290 | NO ITEM | 200 | NO ITEM | NO ITEM | NO ITEM | NO ITEM | NO ITEM | NO ITEM | NO ITEM | NO ITEM | NO ITEM | NO ITEM | NO ITEM | NO ITEM | NO ITEM | | 1216.9 | NO ITEM | NA | NA | NA |
| DPR016 | NO ITEM | | 80 | NO ITEM | 290 | NO ITEM | 200 | NO ITEM | NO ITEM | NO ITEM | NO ITEM | NO ITEM | NO ITEM | NO ITEM | NO ITEM | NO ITEM | NO ITEM | NO ITEM | NO ITEM | NO ITEM | | 1216.9 | NO ITEM | NA | NA | NA |
| DPR017 | NO ITEM | | 80 | NO ITEM | 290 | NO ITEM | 200 | NO ITEM | NO ITEM | NO ITEM | NO ITEM | NO ITEM | NO ITEM | NO ITEM | NO ITEM | NO ITEM | NO ITEM | NO ITEM | NO ITEM | NO ITEM | | 1216.9 | NO ITEM | NA | NA | NA |
| DPR018 | N.A. | | 80 | N.A. | 290 | N.A. | 200 | N.A. | Uncleared | Uncleared | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | Uncleared | Uncleared | | 1216.9 | 1216.9 | N.A. | N.A. | N.A. |
| DPR019 | N.A. | | 80 | N.A. | 290 | N.A. | 200 | N.A. | Uncleared | Uncleared | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | Uncleared | Uncleared | | 1216.9 | 1216.9 | N.A. | N.A. | N.A. |
| DPR046 | BLANK | | 80 | BLANK | 290 | BLANK | 200 | BLANK | NO ITEM | NO ITEM | BLANK | BLANK | BLANK | BLANK | BLANK | BLANK | BLANK | BLANK | BLANK | BLANK | | 1216.9 | BLANK | NA | NA | NA |
| DPR020 | 1073 | 165 | 165 | 621.2 | 621.2 | 414.13 | 414.13 | NO ITEM | NO ITEM | 13.37 | 13.37 | 39.8 | 39.8 | 0.25 | 0.25 | 425 | 425 | NO ITEM | NO ITEM | | 425 | 425 | 0 | 0 | 0 |
| DPR021 | 822 | 408 | 408 | 674 | 674 | 652 | 652 | Uncleared | Uncleared | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | Uncleared | Uncleared | Not Required | Not Required | | 0 | 0 | 0 |
| DPR022 | | | | | | | | | | | | | | | | | | | | | | | | | |
| DPR023 | | | | | | | | | | | | | | | | | | | | | | | | | |
| DPR024 | | | | | | | | | | | | | | | | | | | | | | | | | |
| DPR025 | | | | | | | | | | | | | | | | | | | | | | | | | |
| DPR026 | 1130 | 415 | 415 | 558 | 558 | Not required | Not required | | | Not required | Not required | Not required | Not required | Not required | Not required | Not required | Not required | Not required | Not required | BLANK | BLANK | BLANK | BLANK | BLANK |
| DPR027 | 1130 | 415 | 415 | 558 | 558 | Not required | Not required | | | Not required | Not required | Not required | Not required | Not required | Not required | Not required | Not required | Not required | Not required | BLANK | BLANK | BLANK | BLANK | BLANK |
| DPR028 | 1130 | 415 | 415 | 558 | 558 | Not required | Not required | | | Not required | Not required | Not required | Not required | Not required | Not required | Not required | Not required | Not required | Not required | BLANK | BLANK | BLANK | BLANK | BLANK |
| DPR029 | 1130 | 415 | 415 | 558 | 558 | Not required | Not required | | | Not required | Not required | Not required | Not required | Not required | Not required | Not required | Not required | Not required | Not required | BLANK | BLANK | BLANK | BLANK | BLANK |
| DPR030 | 1519 | 346 | 346 | 932.5 | 932.5 | 541 | 541 | NO ITEM | NO ITEM | 44.349 | 44.349 | 229.309 | 229.309 | 9.033 | 9.033 | 23.01 | 23.01 | NO ITEM | NO ITEM | | 1218 | 1218 | 4.45 | 4.45 | 37.25 |
| DPR031 | 1271 | 80 | 80 | 503 | 503 | 460 | 460 | | | 102.72 | 102.72 | 424.93 | 424.93 | 0.23 | 0.23 | 11.67 | 22.77 | NO ITEM | NO ITEM | BLANK | BLANK | | 0 | 0 | 27.73 |
| DPR032 | 1214.09 | 248 | 248 | 731 | 731 | 32.27 | 32.27 | NO ITEM | NO ITEM | 77.23 | 77.23 | 154.46 | 154.46 | 0 | 0 | 32.27 | 32.27 | 50.33 | 50.33 | | 682.03 | 682.03 | 0.42 | 0.42 | 22.46 |
| DPR033 | 1224 | 174 | 174 | 613.42 | 613.42 | 425 | 425 | NO ITEM | NO IETM | 1.4 | 1.4 | 6.62 | 6.62 | 0.04 | 0.04 | 0.974 | 0.974 | NO ITEM | NO ITEM | | 302.06 | 302.06 | 0 | 0 | 0.974 |
| DPR034 | 1128 | 368 | 368 | 729 | 729 | 547 | 547 | NO ITEM | NO ITEM | 1.3 | 1.3 | 2.55 | 2.55 | 0.05 | BLANK | BLANK | 0.22 | NO ITEM | NO ITEM | | 183.76 | 183.76 | 0.15 | 0.15 | BLANK |
| DPR035 | 1033 | 172 | DPR035 | 563 | 563 | 422 | 422 | NO ITEM | NO ITEM | 0.94 | BLANK | 1.53 | 1.53 | 0.35 | 0.35 | NO ITEM | NO ITEM | 1.53 | 1.53 | | 228.43 | 228.43 | 1.53 | 1.53 | 1.35 |

| | 5.2.2 | 5.3.1 | 5.3.2 | 5.3.3 | 5.3.4 | 5.3.5 | 5.3.6 | 5.3.7 | 5.3.8 | 5.3.9 | 5.3.10 | 5.4 | 6.1 | 6.2 | 6.3 | 6.4 | 7.1.1 | 7.1.2 | 7.1.3 | 7.1.4 | 7.1.5 | 7.1.6 | 7.1.7 | 7.1.8 | 7.2.1 | 7.2.2 | 7.2.3 | 7.2.4 | 7.2.5 | 7.2.6 | 7.2.7 | 7.2.8 | 7.2.9 | 7.2.10 | 7.2.11 | 7.2.12 | 7.3.1 | 7.3.2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 5.2.2 | 5.3.1 | 5.3.2 | 5.3.3 | 5.3.3 | 5.3.4 | 5.3.4 | 5.3.5 | 5.3.6 | 5.3.7 | 5.3.8 | 5.4 | 6.1 | 6.2 | 6.3 | 6.4 | 7.1.1 | 7.1.1 | 7.1.2 | 7.1.2 | 7.1.3 | 7.1.3 | 7.1.4 | 7.1.4 | 7.2.1 | 7.2.1 | 7.2.2 | 7.2.2 | 7.2.3 | 7.2.3 | 7.2.4 | 7.2.4 | 7.2.5 | 7.2.5 | 7.2.6 | 7.2.6 | 7.3.1 | 7.3.1 |
| | Water Utilization Reservation of downstream use | Water Utilization Utilization through the project | Water Utilization Utilization through the project | Water Utilization Utilization through the project | Water Utilization Utilization through the project | Water Utilization Utilization through the project | Water Utilization Utilization through the project | Water Utilization Utilization through the project | Water Utilization Utilization through the project | Water Utilization Utilization through the project | Water Utilization Utilization through the project | Water Utilization Water saved through modemization | Ground water Potential | Ground water Present use | Ground water Proposed use after modernization | Ground water Balance for future utilization after modernization | Reservoir data Storage | Reservoir data Storage | Reservoir data Storage | Reservoir data Storage | Reservoir data Storage | Reservoir data Storage | Reservoir data Storage | Reservoir data Storage | Reservoir data Elevation | Reservoir data Elevation | Reservoir data Elevation | Reservoir data Elevation | Reservoir data Elevation | Reservoir data Elevation | Reservoir data Elevation | Reservoir data Elevation | Reservoir data Elevation | Reservoir data Elevation | Reservoir data Elevation | Reservoir data Elevation | Reservoir data Water spread area at | Reservoir data Water spread area at |
| | Proposed | Present Irrigation | Proposed Irrigation | Present Power Generation | Proposed Power Generation | Present Drinking water | Proposed Drinking water | Present industrial use | Proposed industrial use | Present other use | Proposed other use | | | | | | Original Gross storage | Proposed Gross storage | Original Dead storage | Proposed Dead storage | Original Live storage | Proposed Live storage | Original Annual carry over | Proposed Annual carry over | Original Maximum water level | Proposed Maximum water level | Original Full reservoir level | Proposed Full reservoir level | Original Lowest water level | Proposed Lowest water level | Original Dead storage level | Proposed Dead storage level | Original River bed level | Proposed River bed level | Original Irrigation outlet level | Proposed Irrigation outlet level | Original Dead storage level | Proposed Dead storage level |
| DPRSN | Million m3 | Million m3 | Million m3 | Million m3 | Million m3 | Million m3 | Million m3 | Million m3 | Million m3 | Million m3 | Million m3 | % | Million m3 | Million m3 | Million m3 | Million m3 | Million m3 | Million m3 | Million m3 | Million m3 | Million m3 | Million m3 | Million m3 | Million m3 | m | m | m | m | m | m | m | m | m | m | m | m | km2 | km2 |
| DPR001 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | 17 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| DPR002 | N.A. | 1776.2112 | N.A. | | 0 | N.A. | 0.05 | N.A. | 0.005 | N.A. | 0 | N.A. | 0.17 | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. |
| DPR003 | N.A. | 1776.2112 | N.A. | | 0 | N.A. | 0.05 | N.A. | 0.005 | N.A. | 0 | N.A. | 0.17 | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. |
| DPR004 | N.A. | 1776.2112 | N.A. | | 0 | N.A. | 0.05 | N.A. | 0.005 | N.A. | 0 | N.A. | 0.17 | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. |
| DPR005 | N.A. | 1776.2112 | N.A. | | 0 | N.A. | 0.05 | N.A. | 0.005 | N.A. | 0 | N.A. | 0.17 | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. |
| DPR006 | N.A. | 1776.2112 | N.A. | | 0 | N.A. | 0.05 | N.A. | 0.005 | N.A. | 0 | N.A. | 0.17 | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. |
| DPR007 | NA | 1775.52 | NO ITEM | - | - | NOT CLEAR | NOT CLEAR | NOT CLEAR | NOT CLEAR | NOT CLEAR | NOT CLEAR | 17 | | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| DPR008 | N.A. | 1998.2376 | 1998.2376 | Blank | Blank | Blank | Blank | Blank | Blank | Blank | Blank | Blank | N.A. | Blank | Blank | Blank | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. |
| DPR009 | N.A. | 1998.2376 | 1998.2376 | Blank | Blank | Blank | Blank | Blank | Blank | Blank | Blank | Blank | N.A. | Blank | Blank | Blank | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. |
| DPR010 | N.A. | 1998.2376 | 1998.2376 | Blank | Blank | Blank | Blank | Blank | Blank | Blank | Blank | Blank | N.A. | Blank | Blank | Blank | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. |
| DPR011 | NA | 1998.2376 | 1998.2376 | BLANK | BLANK | BLANK | BLANK | BLANK | BLANK | BLANK | BLANK | BLANK | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| DPR012 | N.A. | 1998.2376 | 1998.2376 | Blank | Blank | Blank | Blank | Blank | Blank | Blank | Blank | Blank | N.A. | Blank | Blank | Blank | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. |
| DPR013 | N.A. | 1998.2376 | 1998.2376 | Blank | Blank | Blank | Blank | Blank | Blank | Blank | Blank | Blank | N.A. | Blank | Blank | Blank | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. |
| DPR014 | N.A. | 1998.2376 | 1998.2376 | Blank | Blank | Blank | Blank | Blank | Blank | Blank | Blank | Blank | N.A. | Blank | Blank | Blank | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. |
| DPR015 | NA | 1998.2376 | 1998.2376 | BLANK | BLANK | BLANK | BLANK | BLANK | BLANK | BLANK | BLANK | BLANK | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| DPR016 | NA | 1998.2376 | 1998.2376 | BLANK | BLANK | BLANK | BLANK | BLANK | BLANK | BLANK | BLANK | BLANK | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| DPR017 | NA | 1998.2376 | 1998.2376 | BLANK | BLANK | BLANK | BLANK | BLANK | BLANK | BLANK | BLANK | BLANK | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| DPR018 | N.A. | 1998.2376 | 1998.2376 | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | Blank | Blank | Blank | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. |
| DPR019 | N.A. | 1998.2376 | 1998.2376 | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | Blank | Blank | Blank | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. |
| DPR046 | NA | 2000 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DPR020 | | 0 | NA | 3.62 | 0 | 0 | 0 | NOT CLEAR | 0 | 0 | 0 | 0 | NOT CLEAR | 36.58 | 45.5 | 44.18 | 1.32 | 9.6 | 9.6 | 0.19 | 0.19 | 9.41 | 9.41 | BLANK | BLANK | 36.5 | 36.8 | 35 | 35 | 31.5 | 31.5 | 28.45 | 28.45 | 25 | 30 | 28.34 | 28.34 | BLANK | BLANK |
| DPR021 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | N.A. | N.A. | N.A. | N.A. | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| DPR022 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DPR023 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DPR024 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DPR025 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DPR026 | BLANK | BLANK | BLANK | BLANK | BLANK | BLANK | BLANK | BLANK | BLANK | BLANK | BLANK | BLANK | BLANK | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEAR | NOT CLEAR |
| DPR027 | BLANK | BLANK | BLANK | BLANK | BLANK | BLANK | BLANK | BLANK | BLANK | BLANK | BLANK | BLANK | BLANK | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEAR | NOT CLEAR |
| DPR028 | BLANK | BLANK | BLANK | BLANK | BLANK | BLANK | BLANK | BLANK | BLANK | BLANK | BLANK | BLANK | BLANK | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEAR | NOT CLEAR |
| DPR029 | BLANK | BLANK | BLANK | BLANK | BLANK | BLANK | BLANK | BLANK | BLANK | BLANK | BLANK | BLANK | BLANK | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEAR | NOT CLEAR |
| DPR030 | 37.25 | NOT CLEAR | NOT CLEAR | NOT CLEAR | NOT CLEAR | NOT CLEAR | NOT CLEAR | NOT CLEAR | NOT CLEAR | NOT CLEAR | NOT CLEAR | BLANK | BLANK | BLANK | BLANK | BLANK | 41.7 | 41.7 | 4.45 | 4.45 | 37.25 | 37.25 | 0 | 0 | 249.84 | 249.84 | 247.62 | 247.62 | 236 | 236 | 240 | 240 | 236 | 236 | 240 | 240 | 1.42 | 1.42 |
| DPR031 | 27.73 | 11.67 | 26.485 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 17.5 | 2.1194 | 0 | 0 | 0 | 27.73 | 27.73 | 0 | 0 | 27.73 | 27.73 | 0 | 0 | 258.05 | 258.17 | 256.05 | 256.05 | 251.19 | 251.19 | 251.19 | 251.19 | 251.19 | 251.19 | 251.19 | 251.19 | 0 | 0 |
| DPR032 | 25.55 | 22.46 | 25.55 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 11 | - | - | - | - | 22.88 | 25.97 | 0.42 | 0.42 | 22.46 | 25.55 | 0.42 | 0.42 | 148.44 | 149.375 | 147.22 | 147.52 | 137.6 | 137.6 | 142.95 | 142.95 | 137.46 | 137.46 | 142.95 | 142.95 | 0.22 | 0.22 |
| DPR033 | 0.974 | 0.974 | 0.974 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 17.5 | - | - | - | - | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0 | 0 | 32.614 | 32.614 | 32.004 | 32.004 | 30 | 30 | 30.48 | 30.48 | 30 | 30 | 30.33 | 30.33 | 0 | 0 |
| DPR034 | BLANK | NOT CLEAR | NOT CLEAR | | 0 | 0 | 0 | 0 | 0 | 0 | 0.15 | 0.15 | BLANK | BLANK | BLANK | BLANK | BLANK | 2.55 | 2.55 | 0.15 | 0.15 | 2.4 | 2.4 | 0 | 0 | 44.2 | 44.2 | 41.75 | 41.75 | 36.57 | 36.57 | 35.5 | 35.5 | 35.5 | 35.5 | 36.57 | 36.57 | 0.02 | 0.02 |
| DPR035 | 1.3 | 1.53 | 1.53 | | 0 | 0 | 0 | 0 | 0 | 0 | 0.18 | 0.18 | BLANK | NA | NA | NA | NA | 1.53 | 1.53 | 0.18 | 0.18 | 1.35 | 1.35 | 0 | 0 | 99.2 | 99.2 | 98.2 | 98.2 | 94.52 | 94.52 | 94.52 | 94.52 | 94.52 | 94.52 | 94.52 | 94.52 | 1.42 | 1.42 |

| | 7.3.3<br>7.3.2 | 7.3.4<br>7.3.2 | 7.3.5<br>7.3.3 | 7.3.6<br>7.3.3 | 7.4.1<br>7.4.1 | 7.4.2<br>7.4.1 | 7.4.3<br>7.4.1 | 7.4.4<br>7.4.2 | 7.4.5<br>7.4.2 | 7.4.6<br>7.4.2 | 7.4.7<br>7.4.3 | 7.4.8<br>7.4.3 | 7.4.9<br>7.4.3 | 8.1.1<br>8.1.1 | 8.1.2<br>8.1.1 | 8.1.3<br>8.1.1 | 8.1.4<br>8.1.1 | 8.1.5<br>8.1.2 | 8.1.6<br>8.1.2 | 8.2.1<br>8.2 | 8.2.2<br>8.2 | 8.2.3<br>8.2 | 8.2.4<br>8.2 | 8.2.5<br>8.2 | 8.2.6<br>8.2 | 8.3.1<br>8.3 | 8.3.2<br>8.3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Reservoir data | Reservoir data | Reservoir data | Reservoir data | Reservoir data | Reservoir data | Reservoir data | Reservoir data | Reservoir data | Reservoir data | Reservoir data | Reservoir data | Reservoir data | Canal to be furnished | Canal to be furnished | Canal to be furnished | Canal to be furnished | Canal to be furnished | Canal to be furnished | Canal to be furnished | Canal to be furnished | Canal to be furnished | Canal to be furnished | Canal to be furnished | Canal to be furnished | Canal to be furnished | Canal to be furnished |
| | Water spread area at | Water spread area at | Water spread area at | Water spread area at | Water Quality | Water Quality | Water Quality | Water Quality | Water Quality | Water Quality | Water Quality | Water Quality | Water Quality | Length canal | Length canal | Length canal | Length canal | Length canal | Length canal | Full supply level at canal head | Full supply level at canal head | Full supply level at canal head | Full supply level at canal head | Full supply level at canal head | Full supply level at canal head | Full supply discharge at canal head | Full supply discharge at canal head |
| | Original Full reservoir level | Proposed Full reservoir level | Original Maximum water level | Proposed Maximum water level | Reserver Physical | Canal Physical | River Physical | Reserver Chemical | Canal Chemical | River Chemical | Reserver Bacteriological | Canal Bacteriological | River Bacteriological | Existing Main | Proposed Main | Existing Main 2 | Proposed Main 2 | Existing Branch lining | Proposed Branch lining | Canal 1 Existing | Canal 1 Proposed | Canal 2 Existing | Canal 2 Proposed | Canal 3 Existing | Canal 3 Proposed | Canal 1 Existing | Canal 1 Proposed |
| DPRSN | km2 | km2 | km2 | km2 | Text | Text | Text | Text | Text | Text | Text | Text | Text | km | km | km | km | km | km | m | m | m | m | m | m | m3/s | m3/s |
| DPR001 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | 19.14 | 19.14 | | | | | 168.72 | 168.72 | | | | | 7.7 | 7.7 |
| DPR002 | N.A. | N.A. | N.A. | N.A. | O.K. | O.K. | O.K. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | 36.42 | N.A. | u | u | u | u | 172.07 | N.A. | Uncleared | Uncleared | Uncleared | Uncleared | 3.32 | N.A. |
| DPR003 | N.A. | N.A. | N.A. | N.A. | O.K. | O.K. | O.K. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | 62.48 | N.A. | Uncleared | Uncleared | Uncleared | Uncleared | 178.63 | N.A. | Uncleared | Uncleared | Uncleared | Uncleared | 6.34 | N.A. |
| DPR004 | N.A. | N.A. | N.A. | N.A. | O.K. | O.K. | O.K. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | 9.68 | N.A. | Uncleared | Uncleared | Uncleared | Uncleared | 170.58 | N.A. | Uncleared | Uncleared | Uncleared | Uncleared | 2.07 | N.A. |
| DPR005 | N.A. | N.A. | N.A. | N.A. | O.K. | O.K. | O.K. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | 4.31 | N.A. | Uncleared | Uncleared | Uncleared | Uncleared | 169.11 | N.A. | Uncleared | Uncleared | Uncleared | Uncleared | 4.62 | N.A. |
| DPR006 | N.A. | N.A. | N.A. | N.A. | O.K. | O.K. | O.K. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | 12.36 | N.A. | Uncleared | Uncleared | Uncleared | Uncleared | 177.79 | N.A. | Uncleared | Uncleared | Uncleared | Uncleared | 1.05 | N.A. |
| DPR007 | NA | NA | NA | NA | Good | Good | Good | BLANK | BLANK | BLANK | BLANK | BLANK | BLANK | 36.42 | NO ITEM | NO ITEM | NO ITEM | NO ITEM | NO ITEM | 172.07 | NO ITEM | NO ITEM | NO ITEM | NO ITEM | NO ITEM | 3.32 | NO ITEM |
| DPR008 | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | 33.32 | 33.32 | Uncleared | Uncleared | Uncleared | Uncleared | 191.675 | 191.675 | Uncleared | Uncleared | Uncleared | Uncleared | 8.7887 | 8.7887 |
| DPR009 | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | 45.72 | 45.72 | Uncleared | Uncleared | Uncleared | Uncleared | 184.91 | 184.91 | Uncleared | Uncleared | Uncleared | Uncleared | 3.9647 | 3.9647 |
| DPR010 | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | 34.217 | 34.217 | Uncleared | Uncleared | Uncleared | Uncleared | 181.263 | 181.263 | Uncleared | Uncleared | Uncleared | Uncleared | 6.1702 | 6.1702 |
| DPR011 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | 34.915 | NO ITEM | NO ITEM | NO ITEM | NO ITEM | NO ITEM | 191.62 | NO ITEM | NO ITEM | NO ITEM | NO ITEM | NO ITEM | 1.2173 | NO ITEM |
| DPR012 | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | 39 | 39 | Uncleared | Uncleared | Uncleared | Uncleared | 184.51 | 184.51 | Uncleared | Uncleared | Uncleared | Uncleared | 3.9647 | 3.9647 |
| DPR013 | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | 23.78 | 23.78 | Uncleared | Uncleared | Uncleared | Uncleared | 181.85 | 181.85 | Uncleared | Uncleared | Uncleared | Uncleared | 1.3829 | 1.3829 |
| DPR014 | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | 30.837 | 30.837 | Uncleared | Uncleared | Uncleared | Uncleared | 189.342 | 189.342 | Uncleared | Uncleared | Uncleared | Uncleared | 1.4321 | 1.4321 |
| DPR015 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | 31.51 | NO ITEM | NO ITEM | NO ITEM | NO ITEM | NO ITEM | 190.75 | NO ITEM | NO ITEM | NO ITEM | NO ITEM | NO ITEM | 0.7622 | NO ITEM |
| DPR016 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | 20.732 | NO ITEM | NO ITEM | NO ITEM | NO ITEM | NO ITEM | 181.563 | NO ITEM | NO ITEM | NO ITEM | NO ITEM | NO ITEM | 6.1702 | NO ITEM |
| DPR017 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | 19.46 | NO ITEM | NO ITEM | NO ITEM | NO ITEM | NO ITEM | 187.5 | NO ITEM | NO ITEM | NO ITEM | NO ITEM | NO ITEM | 1.1539 | NO ITEM |
| DPR018 | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | 24.391 | 24.391 | Uncleared | Uncleared | Uncleared | Uncleared | 193.015 | 193.015 | Uncleared | Uncleared | Uncleared | Uncleared | 1.572 | 1.527 |
| DPR019 | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | 21.367 | 21.367 | Uncleared | Uncleared | Uncleared | Uncleared | 191.31 | 191.31 | Uncleared | Uncleared | Uncleared | Uncleared | 1.5914 | 1.5914 |
| DPR046 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DPR020 | BLANK | BLANK | BLANK | BLANK | Potable | Potable | Potable | C1.200 | C1.200 | C1.200 | NA | NA | NA | 4.37 | 4.37 | 0.04 | 0.04 | 0.66 | 0.66 | 351.6 | 351.6 | 351.8 | 351.8 | 344.6 | 344.6 | 0.5333 | 0.5333 |
| DPR021 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 23.35 | 23.35 | Uncleared | Uncleared | Uncleared | Uncleared | 181.98 | 181.98 | Uncleared | Uncleared | Uncleared | Uncleared | 8.5 | 8.5 |
| DPR022 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DPR023 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DPR024 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DPR025 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DPR026 | NOT CLEAR | NOT CLEAR | NOT CLEAR | NOT CLEAR | NOT CLEAR | NOT CLEAR | NOT CLEAR | NOT CLEAR | NOT CLEAR | NOT CLEAR | NOT CLEAR | NOT CLEAR | NOT CLEAR | 5.12 | 5.12 | | | | | 186.12 | 186.12 | | | | | NOT CLEAR | NOT CLEAR |
| DPR027 | NOT CLEAR | NOT CLEAR | NOT CLEAR | NOT CLEAR | NOT CLEAR | NOT CLEAR | NOT CLEAR | NOT CLEAR | NOT CLEAR | NOT CLEAR | NOT CLEAR | NOT CLEAR | NOT CLEAR | 2.13 | 2.13 | | | | | 186.69 | 186.69 | | | | | 0.16 | 0.16 |
| DPR028 | NOT CLEAR | NOT CLEAR | NOT CLEAR | NOT CLEAR | NOT CLEAR | NOT CLEAR | NOT CLEAR | NOT CLEAR | NOT CLEAR | NOT CLEAR | NOT CLEAR | NOT CLEAR | NOT CLEAR | 2.29 | 2.29 | | | | | 186.69 | 186.69 | | | | | 0.26488 | 0.26488 |
| DPR029 | NOT CLEAR | NOT CLEAR | NOT CLEAR | NOT CLEAR | NOT CLEAR | NOT CLEAR | NOT CLEAR | NOT CLEAR | NOT CLEAR | NOT CLEAR | NOT CLEAR | NOT CLEAR | NOT CLEAR | 2.29 | 2.29 | | | | | 186.69 | 186.69 | | | | | 0.123 | 0.123 |
| DPR030 | 9.3687 | 9.3687 | 10.3 | 10.3 | Good | Good | Good | Good | Good | Good | Good | Good | Good | 17.55 | 17.55 | | | | 241.37 | 241.37 | | | | | | 3.6242 | 3.6242 |
| DPR031 | 1813 | 1813 | - | - | Good | Good | Good | Good | Good | Good | Good | Good | Good | 43.63 | 43.63 | | | | | 252.39 | 252.39 | | | | | 4.896 | 3.928 |
| DPR032 | 95.48 | 108.5 | 109.28 | 124.182 | Good | Good | Good | - | - | - | - | - | - | 17.5 | 20.33 | | | | | 143.85 | 143.85 | | | | | 3.4439 | 3.4439 |
| DPR033 | 0.5 | 0.5 | 0.76 | 0.76 | Good | Good | Good | - | - | - | - | - | - | 4.65 | 4.65 | | | | | 30.95 | 30.95 | | | | | 0.1183 | 0.1183 |
| DPR034 | 1.02 | 1.02 | 1.2 | 1.2 | Good | Good | Good | Good | Good | Good | Good | Good | Good | 7.65 | 7.65 | | | | | 26.41 | 26.41 | | | | | 0.4645 | 0.4645 |
| DPR035 | 0.6125 | 0.6125 | 0.7325 | 0.7325 | No contramention | No contramention | No contramention | No contramention | No contramention | No contramention | No contramention | No contramention | No contramention | 3.12 | 3.12 | | | | | 94.52 | 94.52 | | | | | 0.2809 | 0.2809 |

| | 8.3.3 | 8.3.4 | 8.3.5 | 8.3.6 | 8.4.1 | 8.4.2 | 8.5.1 | 8.5.2 | 8.6.1 | 8.6.2 | 8.6.3 | 8.6.4 | 8.6.5 | 8.6.6 | 8.7.1 | 8.7.2 | 9 | 10.1 | 10.2 | 11.1.1 | 11.1.2 | 11.2.1 | 11.2.2 | 11.3.1 | 11.3.2 | 12.1.1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 8.3 | 8.3 | 8.3 | 8.3 | 8.4 | 8.4 | 8.5 | 8.5 | 8.6.1 | 8.6.1 | 8.6.2 | 8.6.2 | 8.6.3 | 8.6.3 | 8.6.4 | 8.6.4 | 9 | 10 | 10 | 11.1 | 11.1 | 11.2 | 11.2 | 11.3 | 11.4 | 12.1.2 |
| | Canal to be furnished Full supply discharge at canal head | Canal to be furnished Full supply discharge at canal head | Canal to be furnished Full supply discharge at canal head | Canal to be furnished Full supply discharge at canal head | Canal to be furnished Length of complete distribution system upto minors | Canal to be furnished Length of complete distribution system upto minors | Canal to be furnished Villages served | Canal to be furnished Villages served | Canal to be furnished Areas | Canal to be furnished Areas | Canal to be furnished Areas | Canal to be furnished Areas | Canal to be furnished Areas | Canal to be furnished Areas | Canal to be furnished Intensity of Irrigation | Canal to be furnished Intensity of Irrigation | Power | Cropping pattern Is attached? | Cropping pattern is approved by DOA? | Benefits Food grains | Benefits Food grains | Benefits Commercial crops | Benefits Commercial crops | Benefits Others | Benefits Others | Revenue Irrigation |
| | Canal 2 Existing | Canal 2 Proposed | Canal 3 Existing | Canal 3 Proposed | Existing | Proposed | Existing | Proposed | Existing GCA | Proposed GCA | Existing CCA | Proposed CCA | Existing AI | Proposed AI | Existing | Proposed | | | | Existing | Proposed | Existing | Proposed | Existing | Proposed | Existing |
| DPRSN | m3/s | m3/s | m3/s | m3/s | km | km | Nos | Nos | ha | ha | ha | ha | ha | ha | % of CCA | % of CCA | text | Yes/No | Yes/No | INR | INR | INR | INR | INR | INR | Lacs INR / year |
| DPR001 | | | | | 1343.29 | 1343.29 | 1222 | 1222 | 425000 | 425000 | 314000 | 314000 | 365000 | 365000 | 79 | 79 | NA | | | | | | | | | |
| DPR002 | Uncleared | Uncleared | Uncleared | Uncleared | 1343.29 | N.A. | 1152 | N.A. | 425000 | N.A. | 314000 | na | 365000 | N.A. | 79 | N.A. | N.A. | Yes | Uncleared | Blank | Blank | Blank | Blank | Blank | Blank | With WUA's |
| DPR003 | Uncleared | Uncleared | Uncleared | Uncleared | 1343.29 | N.A. | 1222 | N.A. | 425000 | N.A. | 314000 | N.A. | 365000 | N.A. | 79 | N.A. | N.A. | Yes | Uncleared | Blank | Blank | Blank | Blank | Blank | Blank | With WUA's |
| DPR004 | Uncleared | Uncleared | Uncleared | Uncleared | 1343.29 | N.A. | 1222 | N.A. | 425000 | N.A. | 314000 | N.A. | 364000 | N.A. | 79 | N.A. | N.A. | Yes | Uncleared | Blank | Blank | Blank | Blank | Blank | Blank | With WUA's |
| DPR005 | Uncleared | Uncleared | Uncleared | Uncleared | 1343.29 | N.A. | 1222 | N.A. | 425000 | N.A. | 314000 | N.A. | 365000 | N.A. | 79 | N.A. | N.A. | Yes | Uncleared | Blank | N.A. | Blank | N.A. | Blank | N.A. | With WUA's |
| DPR006 | Uncleared | Uncleared | Uncleared | Uncleared | 1343.29 | N.A. | 1222 | N.A. | 425000 | N.A. | 314000 | N.A. | 365000 | N.A. | 79 | N.A. | N.A. | Yes | Uncleared | Blank | N.A. | Blank | N.A. | Blank | N.A. | With WUA's |
| DPR007 | NO ITEM | NO ITEM | NO ITEM | NO ITEM | 1343.29 | NO ITEM | 1152 | 1152 | 425000 | NO ITEM | 314000 | NO ITEM | 365000 | NO ITEM | 79 | NO ITEM | NA | Yes | No | BLANK | BLANK | BLANK | BLANK | BLANK | BLANK | NOT CLEAR |
| DPR008 | Uncleared | Uncleared | Uncleared | Uncleared | 33.32 | 33.32 | Blank | Blank | 11123.07 | 11123.07 | 9269.23 | 9269.23 | 3893.07 | 3893.07 | 79 | 79 | N.A. | Yes | Uncleared | Blank | Blank | Blank | Blank | Blank | Blank | With WUA's |
| DPR009 | Uncleared | Uncleared | Uncleared | Uncleared | 45.72 | 45.72 | Blank | Blank | 10257 | 10257 | 8547.36 | 8547.36 | 3846.41 | 3846.41 | 79 | 79 | N.A. | Yes | Uncleared | Blank | Blank | Blank | Blank | Blank | Blank | With WUA's |
| DPR010 | Uncleared | Uncleared | Uncleared | Uncleared | 34.217 | 34.217 | Blank | Blank | 11332 | 11332 | 9443.32 | 9443.32 | 3966.19 | 3966.19 | 79 | 79 | N.A. | Yes | Uncleared | Blank | Blank | Blank | Blank | Blank | Blank | With WUA's |
| DPR011 | NO ITEM | NO ITEM | NO ITEM | NO ITEM | 34.915 | NO ITEM | BLANK | NO ITEM | 10204 | NO ITEM | 8503.31 | NO ITEM | 3571.39 | NO ITEM | 79 | NO ITEM | NA | Yes | No | BLANK | BLANK | BLANK | BLANK | BLANK | BLANK | NOT CLEAR |
| DPR012 | Uncleared | Uncleared | Uncleared | Uncleared | 39 | 39 | Blank | Blank | 10213.12 | 10213.12 | 8510.94 | 8510.94 | 3574.59 | 3574.59 | 79 | 79 | N.A. | Yes | Uncleared | Blank | Blank | Blank | Blank | Blank | Blank | With WUA's |
| DPR013 | Uncleared | Uncleared | Uncleared | Uncleared | 23.78 | 23.78 | Blank | Blank | 11335 | 11335 | 9445.74 | 9445.74 | 3967.21 | 3967.21 | 79 | 79 | N.A. | Yes | Uncleared | Blank | Blank | Blank | Blank | Blank | Blank | With WUA's |
| DPR014 | Uncleared | Uncleared | Uncleared | Uncleared | 30.837 | 30.837 | Blank | Blank | 9877.63 | 9877.63 | 8231.36 | 8231.36 | 3457.17 | 3457.17 | 79 | 79 | N.A. | Yes | Uncleared | Blank | Blank | Blank | Blank | Blank | Blank | With WUA's |
| DPR015 | NO ITEM | NO ITEM | NO ITEM | NO ITEM | 31.51 | NO ITEM | BLANK | NO ITEM | 11887.74 | NO ITEM | 9906.45 | NO ITEM | 4160.71 | NO ITEM | 79 | NO ITEM | NA | Yes | NO | BLANK | BLANK | BLANK | BLANK | BLANK | BLANK | NOT CLEAR |
| DPR016 | NO ITEM | NO ITEM | NO ITEM | NO ITEM | 20.732 | NO ITEM | BLANK | NO ITEM | 7630 | NO ITEM | 6358.21 | NO ITEM | 2670.45 | NO ITEM | 79 | NO ITEM | NA | Yes | NO | BLANK | BLANK | BLANK | BLANK | BLANK | BLANK | NOT CLEAR |
| DPR017 | NO ITEM | NO ITEM | NO ITEM | NO ITEM | 19.46 | NO ITEM | BLANK | NO ITEM | 5481.76 | NO ITEM | 4568.14 | NO ITEM | 1918.62 | NO ITEM | 79 | NO ITEM | | Yes | NO | BLANK | BLANK | BLANK | BLANK | BLANK | BLANK | NOT CLEAR |
| DPR018 | Uncleared | Uncleared | Uncleared | Uncleared | 24.391 | 24.391 | Blank | Uncleared | 8261.53 | 8261.53 | 6884.61 | 6884.61 | 2891.54 | 2891.54 | 79 | 79 | N.A. | Yes | Uncleared | Blank | Blank | Blank | Blank | Blank | Blank | With WUA's |
| DPR019 | Uncleared | Uncleared | Uncleared | Uncleared | 21.367 | 21.367 | Blank | Uncleared | 8261.53 | 8261.53 | 6884.61 | 6884.61 | 2891.54 | 2891.54 | 79 | 79 | N.A. | Yes | Uncleared | Blank | Blank | Blank | Blank | Blank | Blank | With WUA's |
| DPR046 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DPR020 | 0.0079 | 0.0079 | 0.0274 | 0.0274 | 5.07 | 5.07 | 6 | 6 | 867.56 | 867.56 | 843 | 843 | 773.67 | 773.67 | 58.12 | 91.77 | BLANK | Yes | No | NOT CLEAR | NOT CLEAR | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | 0 |
| DPR021 | Uncleared | Uncleared | Uncleared | Uncleared | Main Canal U.P. Reach 14.00 Km Main Canal Raj. Reach 9.35 Km. Bharatpur Distributory 13.00 Km Sajola Minor 9.9 Km Tamrer Minor 3.5 Km | Main Canal U.P. Reach 14.00 Km Main Canal Raj. Reach 9.35 Km. Bharatpur Distributory 13.00 Km Sajola Minor 9.9 Km Tamrer Minor 3.5 Km | 33 | 37 | 10400 | 10400 | 7278 | 7278 | 7186 | 11136 | 94.6 | 153 | N.A. | Yes | Uncleared | 131577528 | Due to lining of Canal which has been included in this estimate will increase the Crop. Production | Blank | Blank | Blank | Blank | 5.5734 |
| DPR022 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DPR023 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DPR024 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DPR025 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DPR026 | NOT CLEAR | NOT CLEAR | | | 5.12 | 5.12 | 3 | 3 | 567 | 567 | 510 | 510 | 357 | 357 | 30 | 70 | BLANK | Yes | No | BLANK | BLANK | BLANK | BLANK | BLANK | BLANK | 0.13 |
| DPR027 | | | | | 2.13 | 2.13 | 2 | 2 | 441 | 441 | 419 | 419 | 252 | 461 | 40 | 70 | BLANK | Yes | No | 7894000 | | | | | | 0.22 |
| DPR028 | | | | | 2.29 | 2.29 | 2 | 2 | 1176 | 1176 | 338 | 338 | 187 | 187 | 30 | 70 | BLANK | Yes | No | 5650000 | | | | | | 0.02 |
| DPR029 | | | | | 2.29 | 2.29 | 2 | 2 | 436 | 436 | 414 | 414 | 248 | 414 | 40 | 70 | BLANK | Yes | No | 7434000 | | | | | | 0.2 |
| DPR030 | | | | | 58.45 | 58.45 | 30 | 30 | 5073.68 | 5073.68 | 4903.17 | 4903.17 | NOT CLEAR | 4389 | NOT CLEAR | 89.53 | NA | Yes | No | BLANK | BLANK | BLANK | BLANK | BLANK | BLANK | 1.75 |
| DPR031 | | | | | 91.17 | 91.17 | 32 | BLANK | 6640 | 6640 | 5943 | 5943 | 2132.33 | 2132.33 | 35.88 | 90 | NA | Yes | No | NOT CLEAR | NOT CLEAR | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | 5.94 |
| DPR032 | | | | | 37.5 | 43.22 | 20 | 22 | 5373.2 | 5808.41 | 4847.71 | 5280.37 | 3304 | 4224.3 | 68.15 | 80 | NA | Yes | No | NOT CLEAR | NOT CLEAR | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | 0.57 |
| DPR033 | | | | | 4.65 | 4.65 | 1 | 1 | 365.41 | 365.41 | 346.96 | 346.96 | 173.48 | 248.51 | 50 | 82 | NA | Yes | No | NOT CLEAR | NOT CLEAR | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | 0.04 |
| DPR034 | | | | | 7.65 | 7.65 | 9 | 9 | 604.6 | 604.6 | 581.91 | 581.91 | NOT CLEAR | 399.5 | 60 | 68.65 | NA | Yes | No | NOT CLEAR | NOT CLEAR | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | BLANK |
| DPR035 | | | | | 3.12 | 3.12 | 7 | 7 | 246.15 | 246.15 | 240.75 | 240.75 | 192.6 | 192.6 | 80 | 80 | Only Irrigation project | Yes | No | BLANK | BLANK | BLANK | BLANK | BLANK | BLANK | 1 |

| | 12.1.2<br>12.1.2 | 12.2.1<br>12.1.3 | 12.2.2<br>12.1.3 | 12.3.1<br>12.1.4 | 12.3.2<br>12.1.4 | 12.4.1<br>12.1.5 | 12.4.2<br>12.1.5 | 12.5.1<br>12.1.6 | 12.5.2<br>12.1.6 | 12.6.1<br>12.1.6 | 12.6.2<br>12.1.6 | 12.7.1<br>12.2 | 12.7.2<br>12.2 | 12.8.1<br>12.3 | 12.8.2<br>12.3 | 12.9.1<br>12.4 | 12.9.2<br>12.4 | 13.1.1<br>13.1.1 | 13.1.2<br>13.1.2 | 13.1.3<br>13.1.3 | 13.1.4<br>13.1.4 | 13.1.5<br>13.1.5 | 13.2.1<br>13.2 | 13.2.2<br>13.2 | 13.3.1<br>13.2 | 14<br>14 | 15<br>15 | 16<br>16 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Revenue | Revenue | Revenue | Revenue | Revenue | Revenue | Revenue | Revenue | Revenue | Revenue | Revenue | Revenue | Revenue | Revenue | Revenue | Revenue | Revenue | Cost | Cost | Cost | Cost | Cost | Cost | Cost | Cost | Benefit cost ratio | Internal rate of return | Financial return |
| | Irrigation | Domestic Water Supply | Domestic Water Supply | Industrial Water Supply | Industrial Water Supply | Power | Power | Others | Others | Others item | Others item | Revenue from irrigation cess other than water rates | Revenue from irrigation cess other than water rates | Recovery of betterment levy | Recovery of betterment levy | Other source of revenue | Other source of revenue | Estimated cost of modernization works | Estimated cost of modernization works | Estimated cost of modernization works | Estimated cost of modernization works | Estimated cost of modernization works | Cost of completed works | Cost of completed works | Annual cost | | | |
| | Proposed | Existing | Proposed | Existing | Proposed | Existing | Proposed | Existing | Proposed | Existing | Proposed | Existing | Proposed | Existing | Proposed | Existing | Proposed | Irrigation | Domestic Water Supply | Industrial Water Supply | Power | Others | Original | depreciated | depreciated | | | |
| DPRSN | Lacs INR / year | Lacs INR / year | Lacs INR / year | Lacs INR / year | Lacs INR / year | Lacs INR / year | Lacs INR / year | Lacs INR / year | Lacs INR / year | text | text | Lacs INR / year | Lacs INR / year | Lacs INR / year | Lacs INR / year | Lacs INR / year | Lacs INR / year | Lacs | Lacs | Lacs | Lacs | Lacs | Lacs INR | Lacs INR | Lacs INR | Numerical | % | INR |
| DPR001 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DPR002 | N.A. | By P.H.E.D. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | Uncleared | Uncleared | N.A. | N.A. | N.A. | N.A. | Nil | Nil | 505 | 0 | 0 | 0 | 0 | Modernisation works not started | N.A. | N.A. | 0 | 0 | 0 |
| DPR003 | N.A. | By P.H.E.D. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | Uncleared | Uncleared | N.A. | N.A. | N.A. | N.A. | Nil | Nil | 398 | 0 | 0 | 0 | 0 | Modernisation works not started | N.A. | N.A. | N.A. | N.A. | N.A. |
| DPR004 | N.A. | By P.H.E.D. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | Uncleared | Uncleared | N.A. | N.A. | N.A. | N.A. | Nil | Nil | 366 | Blank | Blank | Blank | Blank | Modernisation works not started | N.A. | N.A. | N.A. | N.A. | N.A. |
| DPR005 | N.A. | By P.H.E.D. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | Uncleared | Uncleared | N.A. | N.A. | N.A. | N.A. | Nil | Nil | 248.14 | 0 | 0 | 0 | 0 | Modernisation works not started | Modernisation works not started | 0 | 0 | 0 | 0 |
| DPR006 | N.A. | By P.H.E.D. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | Uncleared | Uncleared | N.A. | N.A. | N.A. | N.A. | Nil | Nil | 170 | Blank | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. |
| DPR007 | NOT CLEAR | NOT CLEAR | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEAR | NOT CLEAR | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | 5.05 | - | - | - | - | | 0 NA | NA | | | |
| DPR008 | With WUA's | Blank | Blank | Blank | Blank | Blank | Blank | Blank | Blank | Uncleared | Uncleared | N.A. | N.A. | N.A. | N.A. | Nil | Nil | 473 | Blank | Blank | Blank | Blank | Modernisation works not started | Modernisation works not started | Blank | | 1.96 | 17.62 Blank |
| DPR009 | With WUA's | Blank | Blank | Blank | Blank | Blank | Blank | Blank | Blank | Uncleared | Uncleared | N.A. | N.A. | N.A. | N.A. | Nil | Nil | 4465 | Blank | Blank | Blank | Blank | Modernisation works not started | Modernisation works not started | Blank | | 1.96 | 17.62 Blank |
| DPR010 | With WUA's | Blank | Blank | Blank | Blank | Blank | Blank | Blank | Blank | Uncleared | Uncleared | N.A. | N.A. | N.A. | N.A. | Nil | Nil | 4434 | Blank | Blank | Blank | Blank | Modernisation works not started | Modernisation works not started | Blank | | 1.96 | 17.62 Blank |
| DPR011 | NOT CLEAR | NOT CLEAR | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | NA | NA | NA | NA | NA | NA | 3082 | BLANK | BLANK | BLANK | BLANK | NA | NA | BLANK | | 1.96 | 17.62 |
| DPR012 | With WUA's | Blank | Blank | Blank | Blank | Blank | Blank | Blank | Blank | Uncleared | Uncleared | N.A. | N.A. | N.A. | N.A. | Nil | Nil | 2737 | Blank | Blank | Blank | Blank | Modernisation works not started | Modernisation works not started | Blank | | 1.96 | 17.62 Blank |
| DPR013 | With WUA's | Blank | Blank | Blank | Blank | Blank | Blank | Blank | Blank | Uncleared | Uncleared | N.A. | N.A. | N.A. | N.A. | Nil | Nil | 2728 | Blank | Blank | Blank | Blank | Modernisation works not started | Modernisation works not started | Blank | | 1.96 | 17.62 Blank |
| DPR014 | With WUA's | Blank | Blank | Blank | Blank | Blank | Blank | Blank | Blank | Uncleared | Uncleared | N.A. | N.A. | N.A. | N.A. | Nil | Nil | 2681 | Blank | Blank | Blank | Blank | Modernisation works not started | Modernisation works not started | Blank | | 1.96 | 17.62 |
| DPR015 | NOT CLEAR | NOT CLEAR | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | NA | NA | NA | NA | | 0 NO ITEM | 2492 | | | | | NA | | BLANK | | 1.96 | 17.62 |
| DPR016 | NOT CLEAR | NOT CLEAR | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | NA | NA | NA | NA | | 0 NO ITEM | 2246 | | | | | | | | | 1.96 | 17.62 |
| DPR017 | NOT CLEAR | NOT CLEAR | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | NA | NA | NA | NA | | 0 NO ITEM | 1882 | | | | | | | | | 1.96 | 17.62 |
| DPR018 | With WUA's | Blank | Blank | Blank | Blank | Blank | Blank | Blank | Blank | Uncleared | Uncleared | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | 1807 | Blank | Blank | Blank | Blank | Modernisation works not started. | Modernisation works not started. | Blank | | 1.96 | 17.62 Blank |
| DPR019 | With WUA's | Blank | Blank | Blank | Blank | Blank | Blank | Blank | Blank | Uncleared | Uncleared | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | 1798 | Blank | Blank | Blank | Blank | Modernisation works not started. | Modernisation works not started. | Blank | | 1.96 | 17.62 Blank |
| DPR046 | | | | | | | | | | | | | | | | | | | | | | | | | | | | 0 |
| DPR020 | 0.3904 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 239.16 | 0 | 0 | 0 | 0 | 50 | 49 | 40.96046 | | 2.38 | NOT CLEAR NOT CLEAR |
| DPR021 | 9.6071 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | Uncleared | Uncleared | 0 | 0 | 0 | 0 | 0 | 4465 | 0 | 0 | 0 | 0 | N.A. | N.A. | Blank | 3.889 | 25.9 | Blank |
| DPR022 | | | | | | | | | | | | | | | | | | | | | | | | | | | | 0 |
| DPR023 | | | | | | | | | | | | | | | | | | | | | | | | | | | | 0 |
| DPR024 | | | | | | | | | | | | | | | | | | | | | | | | | | | | 0 |
| DPR025 | | | | | | | | | | | | | | | | | | | | | | | | | | | | 0 |
| DPR026 | 0.67 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 503.56 | 0 | 0 | 0 | 0 | 0 | 0 | 57.19 | 2.4 | 3090 | 140.04 |
| DPR027 | 0.4 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 241.64 | 0 | 0 | 0 | 0 | 0 | 0 | 28.05 | 2.81 | 3610 | 78.60 Lacs |
| DPR028 | 0.1 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 228.29 | 0 | 0 | 0 | 0 | 0 | 0 | 25.58 | 2.21 | 1350 | 30.92 Lacs |
| DPR029 | 0.34 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 223.18 | 0 | 0 | 0 | 0 | 0 NO ITEM | | 26 | 2.86 | 3890 | 73.63 Lacs |
| DPR030 | NO ITEM | | 0 NO ITEM | | 0 NO ITEM | | 0 NO ITEM | | 25 NO ITEM | Fishery | NO ITEM | | 0 | 0 | 0 | 0 | 0 | 0 | 1328.95 | 0 | 0 | 0 | 0 BLANK | BLANK | BLANK | BLANK | 2980 | BLANK |
| DPR031 | 5.94 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 193 | 193 | 0 | 0 | 0 | 0 | 3835.88 | 0 | 0 | 0 | 0 | | 3835.88 | BLANK | 1.52 | 2058 | BLANK |
| DPR032 | NO ITEM | | 0 NO ITEM | | 0 NO ITEM | | 0 NO ITEM | | 0 NO ITEM | | 0 NO ITEM | | 0 | 0 | 0 | 0 | 0 | 0 BLANK | | 0 | 0 | 0 | 1571.96 NO ITEM | | 151.28 | 1.7 | 2299 | BLANK |
| DPR033 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 150.06 | 0 | 0 | 0 | 0 | 150.06 NO ITEM | | BLANK | 2.1 | 2146 | |
| DPR034 | BLANK | | 0 | 0 | 0 | 0 | 0 | 0 | 1.5 NO ITEM | Fishery | NO ITEM | BLANK | BLANK | BLANK | BLANK | BLANK | BLANK | NOT CLEAR | 0 | 0 | 0 | 0 | 0 | 0 BLANK | | 2.1 | 2115 | |
| DPR035 | NO ITEM | | 0 NO ITEM | | 0 NO ITEM | | 0 NO ITEM | | 0 NO ITEM | NO ITEM | NO ITEM | | 0 NO ITEM | | 0 NO ITEM | | 0 NO ITEM | NOT CLEAR | 0 | 0 | 0 | 0 | 0 BLANK | BLANK | BLANK | 2.4 | BLANK | BLANK |

| | | | | | Majour works | | | Cost | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DPR036 | 19 | Sirohi | Rehabilitation of West Banas Irrigation Project | Medium | Earthen dam & Spill wa | Rehabilitation & lining | New | 0 | 18 | 117 | 0 | 266 | 272 | 214 | 4 | 126 | 1,528 | 1,716 | West Banas Dam & Canal | | | | | #REF! | #REF! | 1903 | | #REF! |
| DPR037 | 20 | Pali | Rehabilitation of Hemawas Irrigation Project | Medium | Earthen dam & Spill wa | Rehabilitation & lining | New | 538 | 372 | 1,984 | 61 | 225 | 2 | 102 | 0 | 331 | 3,286 | 5,266 | Hemawas Irrigation Project | | | | | #REF! | #REF! | 2005 | | #REF! |
| DPR038 | 20 | Pali | Rehabilitation of Phulad Minor Irrigation Project | Minor | Earthen dam & Spill wa | Rehabilitation & lining | New | | | | | | | | | | 458 | 527 | Phulad Minor Irrigation Project | | | | | #REF! | #REF! | 2006 | | #REF! |
| DPR039 | 20 | Pali | Rehabilitation of Amlia Minor Irrigation Project | Minor | Earthen dam & Spill wa | Rehabilitation & lining | New | 33 | 72 | 14 | 1 | 0 | 0 | 0 | 0 | 0 | 123 | 127 | Amlia Minor Irrigation Project | | | | | #REF! | #REF! | 2009 | | #REF! |
| DPR040 | 20 | Pali | Rehabilitation of Dantiwara Minor Irrigation Project | Minor | Earthen dam & Spill wa | Rehabilitation & lining | New | 1 | 9 | 40 | 0 | 8 | 25 | 8 | 1 | 0 | 94 | 94 | Amliy Dam Minor Irrigation Project | | | | | #REF! | #REF! | 2009 | | #REF! |
| DPR041 | 21 | Ajmer | Rehabilitation of Bankey Sagar Sawar Irrigation Project | Minor | Earthen dam & Spill wa | Rehabilitation & lining | New | 13 | 42 | 71 | 5 | 3 | 5 | 0 | 0 | 0 | 142 | 155 | Bankey Sagar Sawar Irrigation Project | | | | | #REF! | #REF! | 2108 | | #REF! |
| DPR042 | 21 | Ajmer | Rehabilitation of Bada Talab Aloli | Minor | Earthen dam & Spill wa | Rehabilitation & lining | New | 9 | 17 | 49 | 1 | 2 | 8 | 2 | 0 | 0 | 89 | 98 | Bada Talab Aloli Irrigation Project | | | | | #REF! | #REF! | 2109 | | #REF! |
| DPR043 | 22 | Tonk | Rehabilitation of GalvaniaMedium Irrigation Project | Medium | Earthen dam & Spill wa | Rehabilitation & lining | New | 34 | 166 | 275 | 2 | 186 | 4 | 111 | 0 | 3 | 797 | 980 | | | | | | #REF! | #REF! | | | #REF! |
| DPR044 | 22 | Tonk | Rehabilitation of Ramsagar Ganwar Irrigation Project | Minor | Earthen dam & Spill wa | Rehabilitation & lining | New | 15 | 39 | 72 | 1 | 48 | 25 | 14 | 0 | 52 | 270 | 285 | Ramsagar Ganwar Irrigation Project | | | | | #REF! | #REF! | | | #REF! |
| DPR045-1 | 23 | Bundi | Rehabilitation of Abhaypura Bimlat Medium Irrigation project | Medium | Earthen dam & Spill wa | Rehabilitation & lining | New | 888 | 2 | 167 | 0 | 341 | 495 | 23 | 3 | 10 | 2,206 | 2,285 | Abhaypura Dam Irrigation project | | | | | #REF! | #REF! | 2305 | | #REF! |
| DPR045-2 | 23 | Bundi | Rehabilitation of Abhaypura Bimlat Medium Irrigation project | Medium | Earthen dam & Spill wa | Rehabilitation & lining | New | luded in DPR045-1 | luded in DPR045-1 | luded in DPR045-1 | luded in DPR045-1 | luded in DPR045-1 | luded in DPR045-1 | luded in DPR045-1 | luded in DPR045-1 | luded in DPR045-1 | luded in DPR045-1 | Included in | Bimlat Medium Irrigation project | | | | | #REF! | #REF! | 2305 | | #REF! |
| DPR047 | 23 | Bundi | Rehabilitation of Burdha Medium Irrigation project | Medium | NA | Rehabilitation & lining | New | 0 | 0 | 0 | 0 | 399 | 453 | 143 | 1 | 1 | 1,016 | 1,093 | Burdha Medium Irrigation project | | | | | #REF! | #REF! | 2305 | | #REF! |
| DPR048 | 23 | Bundi | Rehabilitation of Gurjania Irrigation Project | Minor | Earthen dam & Spill wa | Rehabilitation & lining | New | 9 | 0 | 35 | 2 | 18 | 55 | 17 | 0 | 21 | 160 | 167 | Rehabilitation of Annpurna Irrigation Project | | | | | #REF! | #REF! | 2301 | | #REF! |
| DPR049 | 23 | Bundi | Rehabilitation of Annpurna Irrigation Project | Minor | Spill way | Rehabilitation & lining | New | 10 | 8 | 0 | 1 | 19 | 48 | 1 | 0 | 0 | 90 | 94 | Annpurna Irrigation Project | | | | | #REF! | #REF! | 2302 | | #REF! |
| DPR050 | 23 | Bundi | Rehabilitation of Kumari Ka Naka | Minor | Dam Body | Rehabilitation & lining | New | 0 | 0 | 12 | 0 | 29 | 13 | 17 | 0 | 3 | 76 | 80 | Kumari Ka Naka | | | | | #REF! | #REF! | 2301 | | #REF! |
| DPR051 | 24 | Bhilwara | Renovation of Sareri Medium Irrigation Project | Medium | Dam Body | Rehabilitation & lining | New | 0 | 25 | 48 | 0 | 1,171 | 1,380 | 104 | 1 | 22 | 2,808 | 3,569 | Sareri Dam and Canal under ERM | 1957 | | | | #REF! | #REF! | 2402 | | #REF! |
| DPR052 | 24 | Bhilwara | Renovation of Kothari Medium Irrigation Project | Medium | Earthen dam & Spill wa | Rehabilitation & lining | New | 45 | 58 | 81 | 0 | 73 | 155 | 18 | 1 | 4 | 444 | 547 | | | | | | #REF! | #REF! | 2409 | | #REF! |
| DPR053 | 24 | Bhilwara | Rehabilitation of Shakkargarh Minor Irrigation Project | Minor | Earthen dam & Spill wa | Rehabilitation & lining | New | 62 | 5 | 21 | 0 | 60 | 89 | 11 | 0 | 0 | 253 | 304 | Shakkargarh Minor Irrigation Project | | | | | #REF! | #REF! | 2409 | | #REF! |
| DPR054 | 24 | Bhilwara | Rehabilitation of Sankhra Undi Minor Irrigation Project | Minor | Dam Body | Rehabilitation & lining | New | 38 | 102 | 32 | 2 | 6 | 56 | 3 | 0 | 7 | 251 | 303 | Sankhra Undi Minor Irrigation Project | | | | | #REF! | #REF! | 2409 | | #REF! |
| DPR055 | 24 | Bhilwara | Rehabilitation of Jaliya Minor | Minor | Dam Body | Rehabilitation & lining | New | 0 | 0 | 67 | 0 | 27 | 47 | 1 | 0 | 3 | 149 | 176 | Jaliya Minor Irrigation Project | | | | | #REF! | #REF! | 2404 | | #REF! |
| DPR056 | 24 | Bhilwara | Rehabilitation of Damti Kokra Minor Irrigation Project | Minor | NA | Rehabilitation & lining | New | 0 | 0 | 0 | 0 | 50 | 111 | 2 | 0 | 0 | 164 | 197 | | | | | | #REF! | #REF! | 2411 | | #REF! |
| DPR057 | 26 | Udaipur | Rehabilitation of Sagwara Ki Pal Irrigation Project | Minor | Dam Body | New lining | | 0 | 5 | 0 | 0 | 242 | 89 | 8 | 0 | 8 | 360 | 414 | Sagwara Ki Pal Irrigation Project | | | | | #REF! | #REF! | 2699 | | #REF! |
| DPR058 | 26 | Udaipur | Rehabilitation of Udaisagar Medium Irrigation Project | Medium | Earthen dam & Spill wa | Rehabilitation & lining | New | 480 | 124 | 677 | 100 | 1,459 | 2,974 | 127 | 0 | 134 | 6,198 | 7,281 | | | | | | #REF! | #REF! | 2605 | | #REF! |
| DPR059 | 26 | Udaipur | Rehabilitation of Som Pick Up Weir Medium Irrigation Project | Minor | Spill way | Rehabilitation & lining | New | 54 | 2 | 62 | 0 | 518 | 247 | 33 | 14 | 21 | 970 | 1,294 | | | | | | #REF! | #REF! | 2699 | | #REF! |
| DPR060 | 26 | Udaipur | Rehabilitation of Sei Pick up Weir canani system | Minor | Spill way | Rehabilitation & lining | New | 22 | 2 | 2 | 1 | 97 | 173 | 58 | 0 | 16 | 379 | 443 | | | | | | #REF! | #REF! | 2603 | | #REF! |
| DPR061 | 26 | Udaipur | Rehabilitation of Phila Minor Irrigation Project | Minor | Earthen dam & Spill wa | Rehabilitation & lining | New | | | | | | | | | 13 | 291 | 348 | Phila Minor Irrigation Project | | | | | #REF! | #REF! | 2605 | | #REF! |
| DPR062 | 26 | Udaipur | Rehabilitation of Dundia Minor Irrigation Project | Minor | Earthen dam & Spill wa | Rehabilitation & lining | New | 1 | 31 | 41 | 0 | 55 | 63 | 3 | 0 | 13 | 212 | 245 | | | | | | #REF! | #REF! | 2601 | | #REF! |
| DPR063 | 29 | Chittaurgarh | Rehabilitation of Dorai Irrigation Project | Minor | Dam Body | Rehabilitation & lining | New | 8 | 15 | 77 | 0 | 124 | 134 | 38 | 0 | 14 | 419 | 486 | | | | | | #REF! | #REF! | 2903 | | #REF! |
| DPR064 | 29 | Chittaurgarh | Rehabilitation of Somi Irrigation Project | Minor | Earthen dam & Spill wa | Rehabilitation & lining | New | 112 | 11 | 31 | 1 | 64 | 79 | 2 | 0 | 0 | 306 | 407 | | | | | | #REF! | #REF! | 2901 | | #REF! |
| DPR065 | 29 | Chittaurgarh | Rehabilitation of Umarcha Irrigation Project | Minor | Dam Body | Rehabilitation & lining | New | 0 | 19 | 104 | 0 | 45 | 45 | 0 | 0 | 0 | 214 | 242 | Umarcha Irrigation Project | | | | | #REF! | #REF! | 2903 | | #REF! |
| DPR066 | 29 | Chittaurgarh | Rehabilitation of Nahargarh Irrigation Project | Minor | Dam Body | Rehabilitation & lining | New | 7 | 1 | 91 | 0 | 23 | 39 | 4 | 0 | 0 | 168 | 196 | | | | | | #REF! | #REF! | 2903 | | #REF! |
| DPR067 | 29 | Chittaurgarh | Rehabilitation of Bhanwar Pipla Irrigation Project | Minor | Earthen dam & Spill wa | Rehabilitation & lining | New | 5 | 23 | 6 | 0 | 19 | 76 | 4 | 0 | 6 | 142 | 169 | Bhanwar Pipla Irrigation Project | | | | | #REF! | #REF! | 2903 | | #REF! |
| DPR073 | 30 | Kota | Sawan Bhadon Medium Irrigation Project | Medium | | | | | | | | | | | | | | | Sawan Bhadon Medium Irrigation Project | NOT CLEA | NOT CLEA | NOT CLEA | | #REF! | #REF! | 9999 | | #REF! |
| DPR068 | 31 | Baran | Rehabilitation of Parwan Medium Irrigation Project | Medium | Spill way | Rehabilitation & lining | New | 105 | 0 | 1 | 0 | 454 | 31 | 315 | 3 | 109 | 1,049 | 1,359 | | | | | | #REF! | #REF! | 3104 | | #REF! |
| DPR069 | 31 | Baran | Rehabilitation of Bilas Medium Irrigation project | Medium | Earthen dam & Spill wa | Rehabilitation & lining | New | 6 | 26 | 18 | 0 | 400 | 103 | 163 | 1 | 0 | 738 | 995 | Bilas Medium Irrigation project | | | | | #REF! | #REF! | 3105 | | #REF! |
| DPR070 | 31 | Baran | Rehabilitation of Ganeshgang Lift Irrigation Scheme | Medium | NA | Rehabilitation & lining | New | 0 | 0 | 0 | 0 | 461 | 36 | 171 | 0 | 0 | 789 | 938 | Ganeshgang Lift Irrigation | | | | | #REF! | #REF! | 3101 | | #REF! |
| DPR071 | 32 | Jhalawar | Rehabilitation of Bhimsagar Medium Irrigation Project | Medium | NA | Rehabilitation & lining | New | 0 | 0 | 0 | 0 | 1,751 | 270 | 2,847 | 5 | 1,093 | 6,084 | 6,505 | Bhimsagar Medium Irrigation Project | | | | | #REF! | #REF! | 3201 | | #REF! |
| DPR072 | 32 | Jhalawar | Rehabilitation of Borda Minor Irrigation Project | Minor | Dam Body | Rehabilitation & lining | New | 0 | 0 | 70 | 3 | 66 | 58 | 38 | 0 | 0 | 239 | 239 | | | | | | #REF! | #REF! | 3202 | | #REF! |

| | 2.3 | 2.4 | 2.5 | 2.6 | 2.7.1 | 2.7.2 | 2.7.3 | 2.8.1 | 2.8.2 | 2.8.3 | 2.9 | 3.1 | 3.2.1 | 3.2.2 | 3.3.1 | 3.3.2 | 3.4.1 | 3.4.2 | 3.5.1 | 3.5.2 | 3.5.3 | 3.5.4 | 3.5.5 | 3.5.6 | 3.5.7 | 3.5.8 | 4.1.1 | 4.1.2 | 4.1.3 | 4.2.1 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DPR036 | West Bananas | West Bananas | Near Dhanari village, Swarupganj Town | | 72 | 57 | | 24 | 41 | | 24.68333N 72.95000E | | 19 | #REF! | 0.75-2.50 | | 0.5-2.0 | | 9288 | | 9288 | 1096 | 1096 | 3677 | 3677 | 2274 | 2274 | 507.64 | 414.4 | 93.24 | | 635 |
| DPR037 | Sumer | | Hemawas | Sumer | 73 | 20 | | 24 | 44 | | 24.73333N 73.33333E | | 20 | #REF! | BLANK | | < 2 | NO ITEM | BLANK | BLANK | BLANK | BLANK | BLANK | BLANK | BLANK | BLANK | 907 | NO ITEM | NO ITEM | | 825.5 |
| DPR038 | Phulad | | Phulad | | 73 | 49 | 0 | 25 | 37 | 0 | 25.61667N 73.81667E | | 20 | #REF! | BLANK | | > 2 | | BLANK | BLANK | BLANK | BLANK | BLANK | BLANK | BLANK | BLANK | 4869.2 | NO ITEM | NO ITEM | | 1080 |
| DPR039 | Local Nalaha | NO ITEM | Near Amliya village | Bilar | 73 | 7 | 48 | 24 | 49 | 41 | 24.82806N 73.13000E | | 20 | #REF! | BLANK | | NOT CLEAR | NOT CLEAR | 2075 | | 2075 | 856 | 856 | 120 | 120 | 535 | 535 | NOT CLEAR | NOT CLEAR | NOT CLEAR | | 2111 |
| DPR040 | Local Nalaha | NO ITEM | Near Dantiwada village | Nala | 73 | 20 | 0 | 25 | 14 | 0 | 25.23333N 73.33333E | | 20 | #REF! | BLANK | | NOT CLEAR | NOT CLEAR | 5556 | | 5556 | 2205 | 2205 | 151 | 151 | 3200 | 3200 | 3106 | 3106 | 1205 | | 1205 |
| DPR041 | Local Nalaha | Banas | Near Sarwar | | 75 | 16 | 30 | 26 | 6 | 45 | 26.11250N 75.27500E | | 21 | #REF! | BLANK | | BLANK | | BLANK | BLANK | BLANK | BLANK | BLANK | BLANK | BLANK | BLANK | 15.54 | | | | 843 |
| DPR042 | Local Nalaha | | Near village Aloli | Banas | 75 | 18 | | 75 | 8 | 30 | 75.14167N 75.30000E | | 21 | #REF! | BLANK | BLANK | BLANK | BLANK | BLANK | BLANK | BLANK | BLANK | BLANK | BLANK | BLANK | BLANK | 7.77 | | | | 1069 |
| DPR043 | | | | | | | | | | | 0.00000N 0.00000E | | | #REF! | | | | | | | | | | | | | | | | | |
| DPR044 | | | | | | | | | | | 0.00000N 0.00000E | | | #REF! | | | | | | | | | | | | | | | | | |
| DPR045-1 | Bhimlat | Mez | 26 km ayay from Bundi | Chambal | 75 | 27 | 0 | 25 | 18 | 0 | 25.30000N 75.45000E | | 23 | #REF! | 0 | 0 | NOT CLEAR | NOT CLEAR | - | - | - | - | - | - | - | - | 126.89 | 25.89 | 101 | | 1034 |
| DPR045-2 | Bhimlat | Mez | 36 km ayay from Bundi | Chambal | 74 | 25 | 30 | 25 | 18 | 0 | 25.30000N 74.42500E | | 23 | #REF! | BLANK | BLANK | BLANK | BLANK | BLANK | BLANK | BLANK | BLANK | BLANK | BLANK | BLANK | BLANK | 101 | BLANK | BLANK | | 800 |
| DPR047 | Taler | Chambal | At a sdistance of 10 km south-west of Talera Town | Talera Chambal | 75 | 41 | 45 | 25 | 14 | 40 | 25.24444N 75.69583E | | 23 | #REF! | NOT CLEAR | NOT CLEAR | NOT CLEAR | NOT CLEAR | 20728 | BLANK | 4261 | BLANK | 6680 | BLANK | 1174 | BLANK | 334.13 | 261.61 | NO ITEM | | 877 |
| DPR048 | Owan | Mej | Near village Owan | Owan Chambal | 75 | 21 | 15 | 25 | 26 | 30 | 25.44167N 75.35417E | | 23 | #REF! | BLANK | 600000 | NOT CLEAR | NOT CLEAR | BLANK | | 2900 | BLANK | 696 | BLANK | 174 | BLANK | 1015 | 31.74 | NO ITEM | NO ITEM | BLANK | |
| DPR049 | Natural nalla | NO ITEM | Near village Jajawar | Jajawar | 75 | 43 | 44 | 25 | 44 | 15 | 25.73750N 75.72889E | | 23 | #REF! | 31.33668 | 42.55663 | NOT CLEAR | NOT CLEAR | 1700 | | 1700 | 612 | 612 | 510 | 510 | 425 | 425 | 5.3 | | | | 1096 |
| DPR050 | Local nallha | Mej | Near village negarh | Me Chambal | 75 | 16 | 45 | 25 | 25 | 0 | 25.41667N 75.27917E | | 23 | #REF! | BLANK | 24 | NOT CLEAR | NOT CLEAR | BLANK | | 764 | BLANK | 229.2 | BLANK | 496.6 | BLANK | 38.2 | 2.56 | | | BLANK | |
| DPR051 | Mansi | Banas | BLANK | | 74 | 35 | 14 | 24 | 41 | 52 | 24.69778N 74.58722E | | 24 | #REF! | BLANK | | 2-3 | | 5036 | | 5036 | 1412 | 1412 | 907 | 907 | 0 | 0 | 565 | 369 | 196 | | 858 |
| DPR052 | Kothari River | | Near Nandrai village | Kothari/Banas River Sub Basin | 74 | 59 | 46 | 25 | 19 | 1 | 25.31694N 74.99611E | | Bhilwara | Bhilwara | Blank | | Blank | Blank | 2486 | | 2486 | 697 | 697 | 540 | 540 | 0 | 0 | 2176 | 325 | 1851 | | 1568 |
| DPR053 | Local Nallah | | Near Sakkargarh village | Chambal | 74 | 29 | 0 | 25 | 25 | 0 | 25.41667N 74.48333E | | 24 | #REF! | BLANK | | BLANK | BLANK | 594 | | 594 | 305 | 305 | 300 | 300 | - | - | 74.24 | 12.9 | 61.43 | | 1007 |
| DPR054 | Local Nallah | | Near Sakkargarh Undi village | Banas | 74 | 59 | 0 | 25 | 23 | 0 | 25.38333N 74.98333E | | 24 | #REF! | BLANK | | BLANK | BLANK | 352 | | 352 | 150 | 150 | 50 | 50 | - | - | 3.84 | 0 | 3.84 | | 916 |
| DPR055 | Local Nallah | | Near Banera village | Banas | 74 | 42 | 0 | 25 | 40 | 0 | 25.66667N 74.70000E | | 24 | #REF! | BLANK | | BLANK | BLANK | 428 | | 428 | 100 | 100 | 30 | 30 | - | - | 105.8 | 41.26 | 64.54 | | 1179 |
| DPR056 | Local Nallah | | Near Damti Village | Banas River Sub Basin | 75 | 10 | 6 | 25 | 9 | 20 | 25.15556N 75.16833E | | Bhilwara | Bhilwara | Blank | | Blank | Blank | 934 | | 934 | 94 | 94 | 78 | 78 | 0 | 0 | 36.28 | 36.28 | 0 | | 1250 |
| DPR057 | Mahi (Som) | | Near village Sagwara | Mahi (Som) | 73 | 32 | 30 | 24 | 12 | 30 | 24.20833N 73.54167E | | 26 | #REF! | BLANK | | BLANK | BLANK | 2772 | | 2772 | BLANK | BLANK | BLANK | BLANK | BLANK | BLANK | 47.91 | 44.03 | NO ITEM | | 1179 |
| DPR058 | Banas | | Near village Somi | Local Nallah / Banas River sub Basin | 73 | 49 | 30 | 24 | 34 | 41 | 24.57806N 73.82500E | | Udaipur | Udaipur | Low Income | | 0.25-2 | 0.25-2 | 19000 | | 19000 | 9500 | 9500 | 19000 | 19000 | 57000 | 57000 | 47400 | | | | 987 |
| DPR059 | Som / Mahi | | Diversion Structure | Som / Mahi | 73 | 46 | 0 | 23 | 57 | 0 | 23.95000N 73.76667E | | Udaipur and Dungarpur | Udaipur and Dungarpur | Blank | | Blank | Blank | 1183 | | 1183 | Blank | Blank | Blank | Blank | 59 | 59 | 1864.62 | 714.77 | | | 0 |
| DPR060 | Sabarmati(Sei sub Basin) | | Near village Rohini | Local Nallah / Banas River sub Basin | 73 | 15 | 36 | 24 | 33 | 11 | 24.55306N 73.26000E | | Udaipur | Udaipur | Low Income | | 0.25-2 | 0.25-2 | 402 | | 402 | 201 | 201 | 402 | 402 | 1206 | 1206 | 16750 | | | | 1499 |
| DPR061 | Som | Mahi | Village Phila, G.P. Phila, P.S. Kurabad | | 74 | 4 | 31.8 | 24 | 22 | 20.5 | 24.37236N 74.07550E | | NO ITEM | NO ITEM | NO ITEM | | NO ITEM | | 381 | | 381 | BLANK | BLANK | 152 | 152 | 140 | 140 | 1409 | NO ITEM | NO ITEM | | 888 |
| DPR062 | Banas | | Near village Dhundia | Local Nallah / Banas River sub Basin | 74 | 10 | 0 | 24 | 38 | 50 | 24.64722N 74.16667E | | Udaipur | Udaipur | Low Income | | 0.25-2 | 0.25-2 | 220 | | 220 | Blank | Blank | Blank | Blank | Blank | Blank | 14245 | | | | 1071 |
| DPR063 | Brahamani River | | Near Dorai Village | Brahamani/ Chambal River Sub Basin | 75 | 58 | 30 | 24 | 56 | 30 | 24.94167N 75.97500E | | Chittorgarh | Chittorgarh | Blank | | 0.25-3 | 0.25-3 | 8400 | | 8400 | 1890 | 1890 | 1230 | 1230 | 4500 | 4500 | 68.6 | 68.6 | 0 | | 843 |
| DPR064 | Local Nallah | | Near village Somi | Local Nallah/Banas River Sub Basin | 74 | 21 | 2 | 25 | 58 | 0 | 25.96667N 74.35056E | | Chittorgarh | Chittorgarh | Blank | | 0.25-2 | 0.25-2 | 508 | | 508 | 190 | 190 | 105 | 1230 | 165 | 165 | 116.55 | 52.45 | 64.1 | Blank | |
| DPR065 | Brahamani | Chambal | Near Umarcha village | | 75 | 6 | 30 | 24 | 54 | 30 | 24.90833N 75.10833E | | 29 | #REF! | BLANK | | 0.25-3 | | 229 | | 229 | 17 | 17 | 119 | 119 | 93 | 93 | 31 | 31 | 0 | | 843 |
| DPR066 | Brahamani River | | Near Nahargarh village | Brahamani/ Chambal River Sub Basin | 75 | 22 | 20 | 25 | 2 | 20 | 25.03889N 75.37222E | | Chittorgarh | Chittorgarh | Blank | | 0.25-3 | 0.25-3 | 225 | | 225 | 17 | 17 | 119 | 119 | 89 | 89 | 7.12 | 7.12 | 0 | | 1463 |
| DPR067 | Brahmani | Chamal | Near Dhamancha village | Brahamani Chambal River sub basin | 75 | 3 | 33 | 24 | 54 | 0 | 24.90000N 75.05917E | | 29 | #REF! | BLANK | BLANK | 0.25-3 | 0.25-3 | 2500 | | 2500 | 180 | 180 | 1225 | 1230 | 1095 | 1095 | 15 | 0 | 15 | | 843 |
| DPR073 | NOT CLEAR | NOT CLEAR | NOT CLEAR | NOT CLEAR | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | #VALUE! | NOT CLEAR | NOT CLEAR | NOT CLEAR | NOT CLEAR | | NOT CLEAR | | NOT CLEAR | NOT CLEAR | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEAR | NOT CLEAR | NOT CLEAR | NOT CLEAR | |
| DPR068 | Parwan | | Near village Shergarh | Parwan River | 73 | 20 | 0 | 22 | 30 | 0 | 22.50000N 73.33333E | | Baran | Baran | Blank | | NOT CLEAR | NOT CLEAR | 0 | | 72751 | 0 | 9850 | 0 | 8539 | 0 | 0 | 8294.4 | Uncleared | Uncleared | | 0 |
| DPR069 | Bilas | | 5km ayay frim Bhanwargarh village at Bilas river | Chanbal | 76 | 49 | 46 | 25 | 2 | 48 | 25.04667N 76.82944E | | 31 | #REF! | BLANK | | BLANK | | BLANK | BLANK | BLANK | BLANK | BLANK | BLANK | BLANK | BLANK | BLANK | 233 | 233 | 0 | | 1712 |
| DPR070 | Chambal RMC | | Pump house at 104.5km | Chambal RMC | 76 | 26 | 56.3 | 25 | 17 | 55 | 25.29861N 76.44897E | | 31 | #REF! | NO ITEM | | | | 40200 | | 40200 | 13400 | 13400 | 16200 | 16200 | 9200 | 9200 | NA | NA | NA | | 1712 |
| DPR071 | Ujar | Chamble | Near village Mori Bhimsagar | | 76 | 21 | 0 | 24 | 33 | 0 | 24.55000N 76.35000E | | 32 | #REF! | BLANK | | NOT CLEAR | | 56914 | | 66914 | 9675.38 | 13382.8 | 8537.1 | 11375.38 | 22765.6 | 28103.88 | 335 | NO ITEM | NO ITEM | | 1750.5 |
| DPR072 | Local Nallah of Tolkhera Tributory of Kalisindh River | | Near villabe Tolkhera | Local Nallah Tolkhera / Chambal Basin | 76 | 10 | 9 | 24 | 26 | 18 | 24.43833N 76.16917E | | Jhalawar | Jhalawar | Blank | | NOT CLEAR | NOT CLEAR | 2500 | | 2500 | 16000 | 16000 | 14000 | 14000 | 50000 | 50000 | 13.15 Sqm | Uncleared | Uncleared | | 1897.2 |

| | 4.2.2 | 4.2.3 | 4.2.4 | 4.2.5 | 4.2.6 | 4.2.7 | 4.2.8 | 4.2.9 | 4.2.10 | 4.4.1 | 4.4.2 | 4.4.3 | 4.4.4 | 4.4.5 | 4.4.6 | 4.4.7 | 4.4.8 | 4.4.9 | 4.4.10 | 4.5.1 | 4.5.2 | 5.1.1 | 5.1.2 | 5.2.1 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DPR036 | 635 | 185.8 | 185.8 | 610 | 610 | 400 | 400 | | | 39.05 | 39.05 | 43.02 | 43.02 | 3.8 | 3.8 | | 39.05 | 39.05 | NO ITEM | NO ITEM | 1480.613 | 1480.613 | NOT CLEAR | NOT CLEAR | 0.93 |
| DPR037 | NO ITEM | 265.5 | NO ITEM | 529.86 | NO ITEM | 407.5 | NO ITEM | NO ITEM | NO ITEM | 49.44 | NO ITEM | NO ITEM | NO ITEM | NO ITEM | NO ITEM | | 36.05 | NO ITEM | NO ITEM | NO ITEM | NO ITEM | NO ITEM | NO ITEM | NO ITEM | |
| DPR038 | BLANK | 106 | BLANK | 555 | BLANK | BLANK | BLANK | | | 2.89 | BLANK | 3.72 | BLANK | 0.37 | BLANK | | 2.56 | BLANK | NO ITEM | NO ITEM | 383.83 | 383.83 | BLANK | BLANK | BLANK |
| DPR039 | 2111 | 219 | 219 | 704.27 | 704.27 | 487.15 | 487.15 | NO ITEM | NO ITEM | 1.39 | 1.39 | 4.26 | 4.26 | 0.28 | 0.28 | NO ITEM | NO ITEM | 1.29 | 1.29 | 90.7 | 90.7 | 0.1 | 0.1 | 0 | |
| DPR040 | 1205 | 174 | 174 | 564.96 | 564.96 | 423 | 423 | NO ITEM | NO ITEM | 3.69 | 3.69 | 5.73 | 5.73 | 2 | 2 | NO ITEM | NO ITEM | 3.63 | 3.63 | 143.3 | 143.3 | 0 | 0 | 0 | |
| DPR041 | 843 | 206 | 206 | 533.5 | 533.5 | | | 547 | 547 | 1.033 | 1.033 | 2.902 | 2.902 | 0.064 | 0.064 | | | 1.726 | 1.726 | 84.96 | 84.96 | 0 | 0 | 0 | |
| DPR042 | 1069 | 153 | 153 | 504.29 | 504.29 | NO ITEM | NO ITEM | 443 | 443 | 0.437 | 0.437 | 2.47 | 2.47 | 0.013346 | 0.013346 | NO ITEM | NO ITEM | 0.31361 | 0.31361 | 55.85 | 55.85 | 0 | 0 | 0 | |
| DPR043 | | | | | | | | | | | | | | | | | | | | | | | | | |
| DPR044 | | | | | | | | | | | | | | | | | | | | | | | | | |
| DPR045-1 | 1034 | 145 | 145 | 565 | 565 | 788 | 788 | NO ITEM | NO ITEM | BLANK | BLANK | BLANK | BLANK | BLANK | BLANK | BLANK | BLANK | BLANK | BLANK | 523.55 | 523.55 | 0 | 0 | 0 | |
| DPR045-2 | 800 | 145 | 145 | 531 | 531 | BLANK | BLANK | NO ITEM | NO ITEM | BLANK | BLANK | BLANK | BLANK | BLANK | BLANK | BLANK | BLANK | BLANK | BLANK | 795.45 | 795.45 | 0 | 0 | 0 | |
| DPR047 | BLANK | 405 | BLANK | 615.35 | BLANK | 555 | BLANK | NO ITEM | NO ITEM | 37.74 | BLANK | 99.48 | BLANK | 8.31 | BLANK | 23.65 | BLANK | NO ITEM | NO ITEM | 1245.2 | BLANK | 0 | BLANK | 0 | |
| DPR048 | 990 | BLANK | 254 | BLANK | 629.26 | NO ITEM | NO ITEM | BLANK | 672 | BLANK | 4.05 | BLANK | 11.61 | BLANK | 0.35 | NO ITEM | NO ITEM | BLANK | 4.73 | BLANK | 336.81 | BLANK | - | BLANK | |
| DPR049 | 913.6 | 337 | 257 | 675 | 583 | NO ITEM | NO ITEM | 672 | 606 | 0.8 | 0.628 | 2.37 | 1.587 | 0.133 | 0.6 | NO ITEM | NO ITEM | 0.789 | 0.619 | 87.6 | 87.6 | 0 | 0 | 0 | |
| DPR050 | 998 | BLANK | 254 | BLANK | 629.26 | BLANK | NO ITEM | NO ITEM | 672 | BLANK | 0.327 | BLANK | 0.933 | BLANK | 0.0265 | NO ITEM | NO ITEM | BLANK | 0.386 | BLANK | 67.97 | BLANK | - | BLANK | |
| DPR051 | 858 | 241 | 241 | 492 | 492 | 367 | 367 | | | 28.77 | 28.77 | 75.76 | 75.76 | 2.69 | 2.69 | 9.52 | 9.52 | 21.55 | 21.55 | 1604.57 | 1604.57 | 0 | 0 | 0 | |
| DPR052 | 1568 | 301 | 301 | 609 | 609 | 519 | 519 | Uncleared | Uncleared | 26.65 | 26.65 | 373.82 | 373.82 | 6.92 | 6.92 | 32.31 | 32.31 | 58.27 | 58.27 | 2280.81 | 2280.81 | Nil | nil | Nil | |
| DPR053 | 1007 | 301 | 301 | 669 | 669 | 450 | 450 | NO ITEM | NO ITEM | 2.26 | 2.26 | 3.81 | 3.81 | 0.13 | 0.13 | 0.95 | 0.95 | 3.81 | 3.81 | 543.36 | 543.36 | 0 | 0 | 0 | |
| DPR054 | 916 | 301 | 301 | 700.9 | 700.9 | 505.45 | 505.45 | NO ITEM | NO ITEM | 1.52 | 1.52 | 2.16 | 2.16 | 1.22 | 1.22 | 0.69 | 0.69 | 1.73 | 1.73 | 35.19 | 35.19 | 0 | 0 | 0 | |
| DPR055 | 1179 | 225 | 225 | 616.6 | 616.6 | 447.91 | 447.91 | NO ITEM | NO ITEM | 11.01 | 11.01 | 21.54 | 21.54 | 0.54 | 0.54 | 0.54 | 0.54 | 2.5 | 2.5 | 597.08 | 784.27 | 0 | 0 | 0 | |
| DPR056 | 1250 | 338 | 338 | 794 | 794 | 519 | 519 | Uncleared | Uncleared | 4.74 | 4.74 | 21.59 | 21.59 | 0.934 | 0.934 | 2.91 | 2.91 | 4.74 | 4.74 | 251.26 | 251.26 | Nil | Nil | Nil | |
| DPR057 | 1179 | 383 | 383 | 735.5 | 735.5 | BLANK | BLANK | BLANK | BLANK | BLANK | BLANK | BLANK | BLANK | BLANK | BLANK | BLANK | BLANK | BLANK | BLANK | BLANK | BLANK | 0 | 0 | 0 | | |
| DPR058 | 987 | 293 | 293 | 678 | 678 | 499 | 499 | Uncleared | Uncleared | Blank | Blank | 217.29 | 217.29 | 0.399 | 0.399 | Assured by Diversion | Assured by Diversion | 6.25 | 6.24 | 1420 | 1420 | 0 | 0 | 0 | |
| DPR059 | 1691 | 0 | 288 | 760 | 764 | Blank | Blank | Uncleared | Uncleared | Blank | Blank | Blank | Blank | Blank | Blank | Blank | Blank | Uncleared | Uncleared | Blank | Blank | 0 | 0 | 0 | |
| DPR060 | 1499 | 152 | 152 | 749.2 | 749.2 | 508 | 508 | Uncleared | Uncleared | 3.02 | 3.02 | 11.74 | 11.74 | 1.5 | 1.5 | 0.99 | 0.99 | 2.44 | 2.44 | 252.4 | 252.4 | 0 | 0 | 0 | |
| DPR061 | 888 | 263 | 263 | 609.875 | 609.875 | 449 | 449 | | | 1.36 | 1.36 | NO ITEM | NO ITEM | NO ITEM | NO ITEM | | 0.768 | 0.768 | 1.738 | 1.738 | NOT CLEAR | NOT CLEAR | | 0 | 0 NO ITEM |
| DPR062 | 1071 | 531 | 531 | 728.2 | 728.2 | 546 | 546 | Uncleared | Uncleared | Blank | Blank | Blank | Blank | Blank | Blank | Blank | Blank | Blank | Blank | 915 | 1131 | 0 | 0 | 0 | |
| DPR063 | 843 | 231 | 231 | 805 | 805 | 668.65 | 668.65 | uncleared | uncleared | 20.11 | 20.11 | 87.32 | 87.32 | 0.56 | 0.56 | 10.1 | 10.1 | 15.45 | 15.45 | 482.6 | 482.6 | Nil | Nil | Nil | |
| DPR064 | Blank | 277 | 277 | 560.8 | 560.8 | 473.85 | 473.85 | uncleared | uncleared | 4.64 | 4.64 | 12.26 | 12.26 | 0.62 | 0.62 | 2.85 | 2.85 | 4.6 | 4.6 | 526 | 526 | Nil | Nil | Nil | |
| DPR065 | 843 | 1463 | 1463 | 335 | 335 | 923 | 923 | | | 3.24 | 3.24 | 17.14 | 17.14 | 0.08 | 0.08 | 1.98 | 1.98 | 3.24 | 3.24 | 401 | 401 | 0 | 0 NO ITEM | | |
| DPR066 | 1463 | 335 | 335 | 857 | 857 | 923 | 923 | Uncleared | Uncleared | 1.53 | 1.53 | 4 | 4 | 0.08 | 0.08 | 1.14 | 1.14 | 1.57 | 1.57 | 133 | 133 | Nil | Nil | Nil | |
| DPR067 | 843 | 231 | 231 | 805 | 805 | 668.65 | 668.65 | BLANk | BLANk | 2.18 | 2.18 | 3.33 | 3.33 | 0.08 | 0.08 | 1.98 | 1.98 | 3.24 | 3.24 | 323.4 | 323.4 | 0 | 0 | 0 | |
| DPR073 | NOT CLEAR | NOT CLEAR | NOT CLEAR | NOT CLEA | NOT CLEA | NOT CLEAR | NOT CLEAR | NOT CLEAR | NOT CLEAR | NOT CLEAR | NOT CLEAR | NOT CLEAR | NOT CLEAR | NOT CLEAR | NOT CLEAR | NOT CLEAR | NOT CLEAR | NOT CLEAR | NOT CLEAR | NOT CLEAR | NOT CLEAR | NOT CLEAR | NOT CLEAR | NOT CLEAR | |
| DPR068 | 1399.35 | 0 | 392.825 | 0 | 805 | 0 | 825 | Uncleared | Uncleared | 0 | 241.8 | 0 | 891 | 0 | 29.52 | 0 | 132.2 | Uncleared | Uncleared | 0 | 14448 | 0 | Nil | 0 | |
| DPR069 | NO ITEM | 500 | NO ITEM | 929 | NO ITEM | NOT CLEAR | NO ITEM | NO ITEM | NO ITEM | 41.25 | NO ITEM | 103.33 | NO ITEM | 18.02 | NO ITEM | 27.05 | NO ITEM | NO ITEM | NO ITEM | 1812 | NO ITEM | 0 | NO ITEM | 0 | |
| DPR070 | BLANK | 500 | BLANK | 929 | BLANK | 929 | BLANK | NO ITEM | NO ITEM | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | |
| DPR071 | 1750.5 | 900 | 900 | 267 | 267 | 873 | 873 | | | 135.4 | 135.4 | 419.1 | 419.1 | 8.6 | 8.6 | 56.62 | 56.62 | NO ITEM | NO ITEM | 1924.4 | 1924.4 | - | - | - | |
| DPR072 | 1897.2 | 476.6 | 476.6 | 931.92 | 931.92 | 741 | 741 | Uncleared | Uncleared | 3.9 | 3.9 | 12.77 | 12.77 | 0.64 | 0.64 | 2.16 | 2.16 | Uncleared | Uncleared | 145.01 | 242.68 | 0 | 0 | 0 | |

| | 5.2.2 | 5.3.1 | 5.3.2 | 5.3.3 | 5.3.4 | 5.3.5 | 5.3.6 | 5.3.7 | 5.3.8 | 5.3.9 | 5.3.10 | 5.4 | 6.1 | 6.2 | 6.3 | 6.4 | 7.1.1 | 7.1.2 | 7.1.3 | 7.1.4 | 7.1.5 | 7.1.6 | 7.1.7 | 7.1.8 | 7.2.1 | 7.2.2 | 7.2.3 | 7.2.4 | 7.2.5 | 7.2.6 | 7.2.7 | 7.2.8 | 7.2.9 | 7.2.10 | 7.2.11 | 7.2.12 | 7.3.1 | 7.3.2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DPR036 | | 0.93 | 36.22 | 36.22 | 0 | 0 | 0 | 0 | 1.44 | 1.44 | 0 | 0 | 17.5 | NA | NA | NA | NA | 39.05 | 39.05 | 2.83 | 2.83 | 36.22 | 36.22 | - | - | 337.04 | 337.04 | 334.45 | 334.45 | 327.13 | 327.13 | 327.13 | 327.13 | 321.82 | 321.82 | 327.13 | 327.13 | 1.5 | 1.5 |
| DPR037 | NO ITEM | NO ITEM | NO ITEM | NO ITEM | NO ITEM | NO ITEM | NO ITEM | NO ITEM | NO ITEM | NO ITEM | NO ITEM | NO ITEM | NO ITEM | NO ITEM | NO ITEM | NO ITEM | 62.55 | 62.55 | 0 | 0 | 62.55 | 62.55 | BLANK | BLANK | 226.5978 | 226.5978 | 225.3746 | 225.6804 | 216.8122 | 216.8122 | 216.8122 | 216.8122 | 216.8122 | 216.8122 | NO ITEM | NO ITEM | BLANK | BLANK |
| DPR038 | BLANK | 0.85 | 0.85 | NO ITEM | NO ITEM | 1.87 | 1.87 | NA | NA | BLANK | BLANK | BLANK | NA | NA | NA | NA | 3.72 | 3.72 | 0.227 | 0.227 | 3.493 | 3.493 | BLANK | BLANK | 243.63 | 243.63 | 241.25 | 241.25 | 233 | 233 | 233 | 233 | 233 | 233 | BLANK | BLANK | BLANK | BLANK |
| DPR039 | 0 | 1.15 | 1.15 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | BLANK | NA | NA | NA | 1.25 | 1.25 | 0.1 | 0.1 | 1.15 | 1.15 | 0 | 0 | 115 | 115 | 144.4 | 144.4 | 110 | 110 | 105 | 105 | 105 | 105 | 110 | 110 | 0.2 | 0.2 |
| DPR040 | 0 | 3.49 | 3.49 | 3.64 | 3.64 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | NA | NA | NA | NA | 3.64 | 3.64 | 0.15 | 0.15 | 3.49 | 3.49 | 0 | 0 | 106.3 | 106.3 | 105 | 105 | 100 | 100 | 100 | 100 | 98 | 98 | 100 | 100 | 0.3 | 0.3 |
| DPR041 | 0 | 1.89 | 1.89 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | BLANK | BLANK | BLANK | BLANK | 1.73 | 1.73 | 0 | 1.73 | 1.73 | 1.73 | 1.73 | 1.73 | 100.5 | 100.5 | 100 | 100 | 96.35 | 96.35 | 96.35 | 96.35 | 96.15 | 96.15 | 96.35 | 96.35 | 0 | 0 |
| DPR042 | 0 | 0.7075 | 0.7075 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | NA | NA | NA | NA | 0.7075 | 0.7075 | 0 | 0 | 0.7075 | 0.7075 | 0 | 0 | 100.75 | 100.75 | 100 | 100 | 97.87 | 97.87 | 97.87 | 97.87 | 96.56 | 96.56 | 97.87 | 97.87 | 0 | 0 |
| DPR043 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DPR044 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DPR045-1 | | 0 | NOT CLEAR | NOT CLEAR | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | BLANK | NA | NA | NA | NA | 7.44 | 7.44 | 0.17 | 0.17 | 7.27 | 7.27 | 0 | 0 | 318 | 318 | 316.45 | 316.45 | 308.45 | 308.45 | 308.45 | 308.45 | 302.35 | 302.35 | 311.195 | 311.195 | BLANK | BLANK |
| DPR045-2 | | 0 | NOT CLEAR | NOT CLEAR | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | BLANK | NA | NA | NA | NA | 11.66 | 11.66 | 0.06 | 0.06 | 11.6 | 11.6 | 0 | 0 | 372.39 | 372.39 | 371.55 | 371.55 | 360.57 | 360.57 | 360.57 | 360.57 | 358.14 | 358.14 | 360.57 | 360.57 | 0.04 | 0.04 |
| DPR047 | BLANK | 28.93 | BLANK | - | 0 | 0 | BLANK | 0 | BLANK | 0 | BLANK | BLANK | BLANK | BLANK | BLANK | BLANK | BLANK | 28.97 | BLANK | 0.04 | BLANK | 28.93 | BLANK | 0.2 | BLANK | 270.5 | BLANK | 269.3 | BLANK | 260.7 | BLANK | 262.89 | BLANK | 260.7 | BLANK | NOT CLEA | BLANK | 0.14 | BLANK |
| DPR048 | - | BLANK | 0.88 | BLANK | - | BLANK | - | BLANK | - | BLANK | - | BLANK | BLANK | - | BLANK | - | BLANK | 1.13 | BLANK | 0.25 | BLANK | 0.88 | BLANK | - | BLANK | 101.75 | BLANK | 100 | BLANK | 95 | BLANK | 97 | BLANK | 92.5 | BLANK | 97 | BLANK | 0.128 | |
| DPR049 | 0 | 0.877 | 0.877 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | BLANK | BLANK | BLANK | BLANK | 0.905 | 0.905 | 0.028 | 0.028 | 0.877 | 0.877 | 0.55 | BLANK | 304.43 | 304.43 | 303.06 | 303.06 | 296.36 | 296.36 | 296.36 | 296.36 | BLANK | BLANK | 296.36 | 296.36 | NOT CLEAR | NOT CLEAR |
| DPR050 | - | BLANK | 0.326 | BLANK | - | BLANK | - | BLANK | - | BLANK | - | BLANK | BLANK | - | BLANK | - | BLANK | 0.386 | | 0.006 | | 0.326 | - | | BLANK | 98.6 | BLANK | 98 | BLANK | 95.5 | BLANK | 94 | BLANK | 93.28 | BLANK | 94 | BLANK | 0.007 | |
| DPR051 | | 0 | 54 | 54 | NO ITEM | NO ITEM | 0.424 | 0.424 | 0 | 0 | 0 | 0 | NA | NA | NA | NA | NA | 55.77 | 55.77 | 0.68 | 0.68 | 55.09 | 55.09 | 0 | 0 | 424.89 | 424.89 | 423.67 | 423.67 | 416.66 | 416.66 | 415.96 | 415.96 | 413.65 | 413.65 | 416.66 | 416.66 | 1.02 | 1.02 |
| DPR052 | Nil | | 21.51 | 21.51 | Nil | Nil | Nil | Nil | Nil | Nil | Nil | Nil | Blank | N.A. | N.A. | N.A. | N.A. | 26.04 | 26.04 | 4.53 | 4.53 | 21.51 | 21.51 | 2.5 | 2.5 | 370.9 | 370.9 | 366.25 | 366.25 | 361 | 361 | 357 | 357 | 356.5 | 356.5 | 361 | 361 | 3.74 | 3.74 |
| DPR053 | | 0 | 3.81 | 3.81 | 0 | 0 | 0.495 | 0.495 | 0 | 0 | 0 | 0 | BLANK | NA | NA | NA | NA | 4.3 | 4.3 | 0.5 | 0.5 | 3.81 | 3.81 | 0 | 0 | 156.97 | 156.97 | 155.45 | 155.45 | 151 | 151 | 151 | 151 | 149 | 149 | 150.95 | 150.95 | 0 | 0 |
| DPR054 | | 0 | 1.9 | 1.9 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | NA | NA | NA | NA | 1.9 | 1.9 | 0 | 0 | 1.9 | 1.9 | 0 | 0 | 101.8 | 101.8 | 100.3 | 100.3 | 99.6 | 99.6 | 97.3 | 97.3 | 97.3 | 97.3 | 97.3 | 97.3 | 0 | 0 |
| DPR055 | | 0 | 2.13 | 2.13 | 0 | 0 | 0.54 | 0.54 | 0 | 0 | 0 | 0 | BLANK | NA | NA | NA | NA | 2.67 | 2.67 | 0.54 | 0.54 | 2.13 | 2.13 | 0 | 0 | 105.2 | 105.2 | 104.3 | 104.3 | 102.5 | 102.5 | 99.6 | 99.6 | 99.6 | 99.6 | 102.6 | 102.6 | 0 | 0 |
| DPR056 | Nil | | 4.304 | 4.304 | Nil | Nil | Nil | Nil | Nil | Nil | Nil | Nil | Nil | N.A. | N.A. | N.A. | N.A. | 4.728 | 4.728 | 0.424 | 0.424 | 4.304 | 4.304 | 0 | 0 | 169.4 | 169.4 | 166.88 | 166.88 | 156.65 | 156.65 | 156.65 | 156.65 | 148.81 | 148.81 | 156.65 | 156.65 | Blank | Blank |
| DPR057 | | 0 | 1.811 | 1.811 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | BLANK | BLANK | BLANK | BLANK | BLANK | 2.05 | 2.05 | 0.127 | 0.127 | 1.923 | 1.923 | - | - | 120.3 | 120.3 | 116.3 | 116.3 | 105 | 105 | 105 | 105 | 100.15 | 100.15 | 105 | 105 | BLANK | BLANK |
| DPR058 | | 0 | 22.51 | 22.51 | 0 | 0 | 0 | 0 | 5.09 | 5.09 | 0 | 0 | More command will be serve | 38.46 | 39.92 | 30 | 8.46 | 31.13 | 31.13 | 3.5 | 3.5 | 27.63 | 27.63 | Blank | Blank | 554.15 | 554.15 | 551.7 | 551.7 | 535.2 | 535.2 | 544.37 | 544.37 | 535.2 | 535.2 | 544.37 | 544.37 | 1 | 1 |
| DPR059 | | 0 | 0 | 3831 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | Blank | Blank | Blank | Blank | Blank | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 156.05 | 156.05 | 151.48 | 151.48 | 149.96 | 149.96 | 148.46 | 148.46 | 139.48 | 139.48 | 149.96 | 149.96 | Blank | Blank |
| DPR060 | | 0 | 1.704 | 1.704 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | More command will be serve | 0 | 0 | 0 | 0 | 1.922 | 1.922 | 0.281 | 0.281 | 1.704 | 1.704 | Blank | Blank | 116.5 | 116.5 | 100 | 100 | 97 | 97 | 97 | 97 | 92 | 92 | 97 | 97 | 0.5 | 0.5 |
| DPR061 | NO ITEM | | 1.39 | 1.39 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | NO ITEM | NO ITEM | NO ITEM | NO ITEM | 1.39 | 1.39 | 0.03 | 0.03 | 1.36 | 1.36 | 0 | 0 | 40.386 | 40.386 | 39.32 | 39.32 | 32.68 | 32.68 | 41.46 | 41.46 | 32.61 | 32.61 | 41.46 | 41.46 | 0.123 | 0.123 |
| DPR062 | | 0 | 1.94 | 1.94 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | More command will be serve | 38.46 | 39.92 | 30 | 8.46 | 2.2 | 2.2 | 0.26 | 0.26 | 1.94 | 1.94 | Blank | Blank | 93.3 | 93.3 | 91.7 | 91.7 | 90 | 90 | 90 | 90 | 88.32 | 88.32 | 90 | 90 | 0.11 | 0.11 |
| DPR063 | Nil | | 4.16 | 4.16 | Blank | Blank | 0.5663 | 0.5663 | 0 | 0 | Nil | Nil | Blank | N.A. | N.A. | N.A. | N.A. | 8.49 | 8.49 | 0.22 | 0.22 | 8.27 | 8.27 | 0 | 0 | 163.2 | 163.2 | 161.7 | 161.7 | 153.3 | 153.3 | 153.3 | 153.3 | 152.74 | 152.74 | 153.3 | 153.3 | 0.22 | 0.22 |
| DPR064 | Nil | | 1.32 | 1.32 | 0 | 0 | 0 | 0 | 0 | 0 | Nil | Nil | Blank | N.A. | N.A. | N.A. | N.A. | 2.24 | 2.24 | 0.36 | 0.36 | 1.88 | 1.88 | 0 | 0 | 29.85 | 29.85 | 29 | 29 | 26.5 | 26.5 | 25.85 | 25.85 | 25.05 | 25.05 | 26.5 | 26.5 | 0.005 | 0.005 |
| DPR065 | NO ITEM | | 0.793 | 0.793 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | NA | NA | NA | NA | 0.85 | 0.85 | 0.05 | 0.05 | 0.79 | 0.79 | 0 | 0 | 101.5 | 101.5 | 100 | 100 | 94.5 | 94.5 | 94.5 | 94.5 | 92.37 | 92.37 | 94.5 | 94.5 | 15 | 15 |
| DPR066 | Nil | | 0.793 | 0.793 | Blank | Blank | 0 | 0 | 0 | 0 | Nil | Nil | Blank | N.A. | N.A. | N.A. | N.A. | 0.85 | 0.85 | 0.05 | 0.05 | 0.79 | 0.79 | 0 | 0 | 28.65 | 28.65 | 28 | 28 | 24.8 | 24.8 | 24.8 | 24.8 | 21.7 | 21.7 | 24.8 | 24.8 | 15.7 | 15.7 |
| DPR067 | | 0 | 1.55 | 1.55 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | BLANK | NA | NA | NA | NA | 1.68 | 1.68 | 0.13 | 0.13 | 1.55 | 1.55 | 0 | 0 | 102 | 102 | 101 | 101 | 94 | 94 | 94 | 94 | 91.07 | 91.07 | 94 | 94 | 15.88 | 15.88 |
| DPR073 | NOT CLEAR | NOT CLEAR | NOT CLEAR | NOT CLEAR | NOT CLEAR | NOT CLEAR | NOT CLEAR | NOT CLEAR | NOT CLEAR | NOT CLEAR | NOT CLEAR | NOT CLEAR | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEAR | NOT CLEAR |
| DPR068 | Nil | | 0 | Irrigation | 0 | Nil | 0 | As per local use. | 0 | Nil | 0 | Nil | Nil | N.A. | N.A. | N.A. | N.A. | 0 | 19.6 | 0 | 12.22 | 0 | 5.38 | 0 | Nil | N.A. | N.A. | 0 | 288.4 | 0 | 286.12 | 0 | 286.12 | 0 | 263.85 | 0 | 286.12 | 0 | N.A. | |
| DPR069 | NO ITEM | | 26.76 | NO ITEM | 0 | NO ITEM | 0 | NO ITEM | 0 | NO ITEM | 0 | NO ITEM | BLANK | NA | NA | NA | NA | 28.883 | NO ITEM | 2.123 | NO ITEM | 26.76 | NO ITEM | 0 | NO ITEM | 339.64 | NO ITEM | 338.5 | NO ITEM | 330.4 | NO ITEM | 330.4 | NO ITEM | BLANK | NO ITEM | 330.4 | NO ITEM | BLANK | NO ITEM |
| DPR070 | NA | NOT CLEAR | NOT CLEAR | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| DPR071 | - | | 73.13 | 73.13 | NO ITEM | NO ITEM | 1.58 | 1.58 | - | - | - | - | NOT CLEAR | BLANK | BLANK | BLANK | BLANK | 76.6 | 76.6 | 4.07 | 4.07 | 72.53 | 72.53 | 3.52 | 3.52 | 309.75 | 309.75 | 308.53 | 308.53 | BLANK | BLANK | 249.2 | 249.2 | 282.31 | 282.31 | NOT CLEA | NOT CLEA | - | - |
| DPR072 | | 0 | 2.58 | 2.32 | 0 | 0 | 0 | 0 | 0 | 0 | 0.26 | 0.26 | 0 | 0 | 0 | 0 | 0 | 0.26 | 0.26 | 2.32 | 2.32 | 0 | 0 | 0 | 0 | 339.55 | 339.55 | 338.6 | 338.6 | 325.45 | 325.45 | 331.8 | 331.8 | 325.45 | 325.45 | 331.8 | 331.8 | 0.08141 | 0.08141 |

| | 7.3.3 | 7.3.4 | 7.3.5 | 7.3.6 | 7.4.1 | 7.4.2 | 7.4.3 | 7.4.4 | 7.4.5 | 7.4.6 | 7.4.7 | 7.4.8 | 7.4.9 | 8.1.1 | 8.1.2 | 8.1.3 | 8.1.4 | 8.1.5 | 8.1.6 | 8.2.1 | 8.2.2 | 8.2.3 | 8.2.4 | 8.2.5 | 8.2.6 | 8.3.1 | 8.3.2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DPR036 | 9.4 | 9.4 | 12.14 | 12.14 | Good & Clear | Good & Clear | Good & Clear | Free from chemical | Free from chemical | Free from chemical | Free from biological, contamination | Free from biological, contamination | Free from biological, contamination | 34.74 | 34.74 | 21.64 | 21.64 | | | 1.2 | 1.2 | 0.9 | 0.9 | | | 3.2 | 3.2 |
| DPR037 | BLANK | BLANK | BLANK | BLANK | Good and clear | Good and clear | Good and clear | free from chemicals | free from chemicals | free from chemicals | free from bacteriological | free from bacteriological | free from bacteriological | 38.64 | | | | | | | | | | | | | |
| DPR038 | BLANK | BLANK | BLANK | BLANK | Good & Clear | Good & Clear | Good & Clear | Free from chemical | Free from chemical | Free from chemical | Free from biological, contamination | Free from biological, contamination | Free from biological, contamination | 5.19 | 5.19 | | | | | 233.97 | 233.97 | | | | | 0.63 | 0.63 |
| DPR039 | 0.75 | 0.75 | 0.8 | 0.8 | Good | Good | Good | Good | Good | Good | Good | Good | Good | 2.25 | 2.25 | | | | | | | | | | | 0.34 | 0.34 |
| DPR040 | 1.2 | 1.2 | 1.5 | 1.5 | Good | Good | Good | Good | Good | Good | BLANK | BLANK | BLANK | 6.4 | 6.4 | | | | | 0.85 | 0.85 | | | | | NO ITEM | NO ITEM |
| DPR041 | 2.925 | 2.925 | 3.9 | 3.9 | Clear | Clear | Clear | Potable | Potable | Potable | Potable | Potable | Potable | 4.5 | 4.5 | | | | | 96.8 | 96.8 | | | | | 0.157 | 0.157 |
| DPR042 | 0.91 | 0.91 | 1.22 | 1.22 | Clean | Clean | Clean | Potable | Potable | Potable | Potable | Potable | Potable | 4.4 | 4.4 | | | | | 98.52 | 98.52 | | | | | 0.0564 | 0.0564 |
| DPR043 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DPR044 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DPR045-1 | 0.21 | 0.21 | 1.84 | 1.84 | BLANK | BLANK | BLANK | No contamination | No contamination | No contamination | No contamination | No contamination | No contamination | | 8.41 | | 8.41 | 2.38 | 2.38 | 310.13 | 310.13 | 314.75 | 314.75 | | | 2.79 | 2.79 |
| DPR045-2 | 2.65 | 2.65 | BLANK | BLANK | Good | Good | Good | Good | Good | Good | Good | Good | Good | NOT CLEAR | NOT CLEAR | | | | | BLANK | BLANK | BLANK | BLANK | BLANK | BLANK | BLANK | BLANK |
| DPR047 | 4.54 | BLANK | NA | BLANK | Good | Good | Good | - | - | - | - | - | - | BLANK | BLANK | BLANK | BLANK | BLANK | BLANK | 4.95 | BLANK | 21 | BLANK | 5.4 | BLANK | 0.6 | BLANK |
| DPR048 | BLANK | 0.385 | BLANK | 0.615 | Good | Good | Good | - | - | - | BLANK | BLANK | BLANK | BLANK | 2.31 | NO ITEM | NO ITEM | NO ITEM | NO ITEM | BLANK | 97.6 | NO ITEM | NO ITEM | NO ITEM | NO ITEM | BLANK | 0.176 |
| DPR049 | NOT CLEAR | NOT CLEAR | NOT CLEAR | NOT CLEAR | Good | Good | Good | Good | Good | Good | Good | Good | Good | | 3.3 | | 3.3 | | | 303.06 | 303.06 | | | | | 0.895 | 0.895 |
| DPR050 | BLANK | 0.1032 | BLANK | 0.615 | Good | Good | Good | - | - | - | BLANK | BLANK | BLANK | BLANK | 1.2 | NO ITEM | NO ITEM | NO ITEM | NO ITEM | BLANK | 94.4 | NO ITEM | NO ITEM | NO ITEM | NO ITEM | BLANK | 0.017 |
| DPR051 | 27.545 | 27.545 | 33.054 | 33.054 | Good | Good | Good | Good | Good | Good | Good | Good | Good | 37.9 | 37.9 | 37.9 | 37.9 | NA | NA | 1.2 | 1.2 | | | | | 4.76 | 4.76 |
| DPR052 | 10.43 | 10.43 | 12.516 | 12.516 | Good | Good | Good | Good | Good | Good | Good | Good | Good | 21.975 | 21.975 | Uncleared | Uncleared | Uncleared | Uncleared | 1.2 | 1.2 | Uncleared | Uncleared | Uncleared | Uncleared | 1.36 | 1.36 |
| DPR053 | 0.074 | 0.074 | 0.0888 | 0.0888 | Good | Good | Good | Good | Good | Good | Good | Good | Good | 5.49 | 5.49 | | | | | 0.6 | 0.6 | | | | | 0.119 | 0.119 |
| DPR054 | 0.45 | 0.45 | 0.54 | 0.54 | Good | Good | Good | Good | Good | Good | Good | Good | Good | 5.36 | 5.36 | | | | | 0.45 | 0.45 | | | | | 0.119 | 0.119 |
| DPR055 | 2.98 | 2.98 | 3.576 | 3.576 | Good | Good | Good | Good | Good | Good | Good | Good | Good | 3.64 | 3.64 | | | | | 0.8 | 0.8 | | | | | 0.318 | 0.318 |
| DPR056 | Blank | Blank | Blank | Blank | Good | Good | Good | Good | Good | Good | Good | Good | Good | 11.31 | 11.31 | Uncleared | Uncleared | Uncleared | Uncleared | 0.9 | 0.9 | Uncleared | Uncleared | Uncleared | Uncleared | 0.675 | 0.675 |
| DPR057 | BLANK | BLANK | 0.06 | 0.06 | Potable | Potable | Potable | BLANK | BLANK | BLANK | BLANK | BLANK | BLANK | 9.21 | 9.21 | | | | | 0.85 | 0.85 | | | | | 0.3392 | 0.3392 |
| DPR058 | 7.7 | 7.7 | Blank | Blank | Good | Good | Good | Good | Good | Good | Good | Good | Good | 27 | 27 | 12.6 | 13.6 | Uncleared | Uncleared | 1.05 | 1.05 | 0.6 | 0.6 | Uncleared | Uncleared | 2.347 | 2.347 |
| DPR059 | Blank | Blank | Blank | Blank | Portable | Portable | Portable | Blank | Blank | Blank | Blank | Blank | Blank | 7.68 | 7.68 | Uncleared | Uncleared | Uncleared | Uncleared | 0.6 | 0.6 | Uncleared | Uncleared | Uncleared | Uncleared | Blank | Blank |
| DPR060 | 4.5 | 4.5 | Blank | Blank | Good | Good | Good | Good | Good | Good | Good | Good | Good | 12.48 | 12.48 | Uncleared | Uncleared | Uncleared | Uncleared | 0.7 | 0.7 | Uncleared | Uncleared | Uncleared | Uncleared | 0.375 | 0.375 |
| DPR061 | 0.35 | 0.35 | 0.35 | 0.35 | Good | Good | Good | Good | Good | Good | Good | Good | Good | 2.7 | 2.7 | 2.7 | 2.7 | 0.75 | 0.75 | NOT CLEAR | NOT CLEAR | NOT CLEAR | NOT CLEAR | NOT CLEAR | NOT CLEAR | NOT CLEAR | NOT CLEAR |
| DPR062 | 0.88 | 0.88 | 1.2 | 1.2 | Good | Good | Good | Good | Good | Good | Good | Good | Good | 3.75 | 3.75 | Uncleared | Uncleared | Uncleared | Uncleared | 0.6 | 0.6 | Uncleared | Uncleared | Uncleared | Uncleared | 0.47 | 0.47 |
| DPR063 | 8.49 | 8.49 | 11.5 | 11.5 | Good | Good | Good | Good | Good | Good | Good | Good | Good | 11.67 | 11.67 | Uncleared | Uncleared | Uncleared | Uncleared | 0.75 | 0.75 | Uncleared | Uncleared | Uncleared | Uncleared | 0.67 | 0.67 |
| DPR064 | 0.15 | 0.15 | 0.2 | 0.2 | Good | Good | Good | Good | Good | Good | Good | Good | Good | 4.62 | 4.62 | Uncleared | Uncleared | Uncleared | Uncleared | 0.65 | 0.65 | Uncleared | Uncleared | Uncleared | Uncleared | 0.224 | 0.224 |
| DPR065 | 48 | 48 | 59 | 59 | Good | Good | Good | Good | Good | Good | Good | Good | Good | 6.1 | 6.1 | 6.1 | 6.1 | incl. main | incl. main | 0.4 | 0.4 | | | | | 0.23 | 0.23 |
| DPR066 | 47 | 47 | 59.5 | 59.5 | Good | Good | Good | Good | Good | Good | Good | Good | Good | 4.05 | 4.05 | Uncleared | Uncleared | Uncleared | Uncleared | 0.4 | 0.4 | Uncleared | Uncleared | Uncleared | Uncleared | 0.22 | 0.22 |
| DPR067 | 45.15 | 45.15 | 50.75 | 50.75 | Good | Good | Good | Good | Good | Good | | | | 5.42 | 5.42 | | | | | 0.75 | 0.75 | | | | | 0.35 | 0.35 |
| DPR073 | NOT CLEAR | NOT CLEAR | NOT CLEAR | NOT CLEAR | NOT CLEAR | NOT CLEAR | NOT CLEAR | NOT CLEAR | NOT CLEAR | NOT CLEAR | NOT CLEAR | NOT CLEAR | NOT CLEAR | NOT CLEAR | NOT CLEAR | NOT CLEAR | NOT CLEAR | NOT CLEAR | NOT CLEAR | NOT CLEAR | NOT CLEAR | NOT CLEAR | NOT CLEAR | NOT CLEAR | NOT CLEAR | NOT CLEAR | NOT CLEAR |
| DPR068 | 0 | N.A. | 0 | N.A. | Good | Good | Good | Good | Good | Good | Good | Good | Good | 0 | 10.76 | Uncleared | Uncleared | Uncleared | Uncleared | Blank | Blank | Uncleared | Uncleared | Uncleared | Uncleared | 0 | 5.38 |
| DPR069 | 6.11 | NO ITEM | BLANK | BLANK | BLANK | BLANK | BLANK | BLANK | BLANK | BLANK | BLANK | BLANK | BLANK | 26.04 | | 22.53 | | | | 331.7 | NO ITEM | | | | | 2.916 | NO ITEM |
| DPR070 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | 23.62 | | | | 25.44 | | 1.22 | | | | | | 3.03 | |
| DPR071 | 15 | 15 | 15 | 15 | Good | Good | Good | ph7.90 TDS 450 PPM | ph7.90 TDS 450 PPM | BLANK | BLANK | BLANK | BLANK | 16.36 | 16.36 | 29.26 | 29.26 | 60.3 | 60.3 | 1.1 | 1.1 | 1.8 | 1.8 | 0.9 | 0.9 | 5.24 | 5.24 |
| DPR072 | 0.9225 | 0.9225 | 1.3851 | 1.3851 | Portable | Portable | Portable | Portable | Portable | Portable | Portable | Portable | Portable | 3.96 | 3.96 | Uncleared | Uncleared | Uncleared | Uncleared | 0.58 | 0.58 | Uncleared | Uncleared | Uncleared | Uncleared | 0.47 | 0.47 |

| | 8.3.3 | 8.3.4 | 8.3.5 | 8.3.6 | 8.4.1 | 8.4.2 | 8.5.1 | 8.5.2 | 8.6.1 | 8.6.2 | 8.6.3 | 8.6.4 | 8.6.5 | 8.6.6 | 8.7.1 | 8.7.2 | 9 | 10.1 | 10.2 | 11.1.1 | 11.1.2 | 11.2.1 | 11.2.2 | 11.3.1 | 11.3.2 | 12.1.1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DPR036 | | 1 | 1 | | | 74.24 | 74.24 | 36 | 36 | 7952 | 7952 | 9848 | 9848 | 7153 | 7153 | 50 | 90 NA | Yes | No | BLANK | BLANK | BLANK | BLANK | BLANK | BLANK | BLANK |
| DPR037 | | | | | | | | 17 | 17 | 9115 | 9115 | 8704 | 8704 | 6093 | 6093 | 70 | 70 NA | No | No | BLANK | BLANK | BLANK | BLANK | BLANK | BLANK | BLANK |
| DPR038 | | | | | | 5.19 | 5.19 | 7 | 7 | 854.33 | 854.33 | 787.79 | 787.79 | 484.25 | 484.25 | 61.47 | 61.47 NA | Yes | No | NOT CLEAR | NOT CLEAR | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | BLANK |
| DPR039 | | | | | NA | NA | | 2 | 2 | 606.07 | 679.9 | 357.89 | 357.89 | 248.18 | 322.01 | 70 | 90 NA | Yes | No | BLANK | BLANK | BLANK | BLANK | BLANK | BLANK | 1 |
| DPR040 | | | | | NA | NA | | 4 | 4 | 1206.07 | 1206.07 | 806.48 | 806.48 | 499.6 | 725.83 | 70 | 90 NA | Yes | No | BLANK | BLANK | BLANK | BLANK | BLANK | BLANK | 1.2 |
| DPR041 | | | | | | 4.5 | 4.5 | 1 | 1 | 352.22 | 352.22 | 327.81 | 327.81 | 262 | 327.81 | 80 | 100 | 0 NA | No | 4224703 | BLANK | BLANK | BLANK | BLANK | BLANK | 0.29174 |
| DPR042 | | | | | | 4.4 | 4.4 | 1 | 1 | 155 | 155 | 145 | 145 | 107.6 | 145 | 74 | 100 | 0 Yes | No | 2438295.47 | | | | | | 0.1037 |
| DPR043 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DPR044 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DPR045-1 | | 0.52 | 0.52 | | | 42.3 | 42.3 | 15 | 15 | 3632 | 3632 | 3402 | 3402 | 2586 | 2586 | 76 | 76 NO ITEM | Yes | No | NOT CLEAR | NOT CLEAR | BLANK | BLANK | BLANK | BLANK | 0 |
| DPR045-2 | BLANK | BLANK | BLANK | BLANK | BLANK | BLANK | | 15 | 15 | 3632 | 3632 | 3402 | 3402 | 2586 | 2586 | 76 | 76 NO ITEM | No | No | NOT CLEAR | NOT CLEAR | BLANK | BLANK | BLANK | BLANK | 0 |
| DPR047 | | 1.95 | BLANK | 0.75 | BLANK | NOT CLEAR | NOT CLEAR | 23 | 23 | 5016.6 | BLANK | 4274.87 | BLANK | 4274.87 | BLANK | 100 | BLANK | 0 Yes | No | 185300000 | NO ITEM | NO ITEM | NO ITEM | NO ITEM | NO ITEM | 4.93 |
| DPR048 | NO ITEM | NO ITEM | NO ITEM | NO ITEM | BLANK | - | BLANK | 1 | BLANK | 130.63 | BLANK | 124.38 | BLANK | 124.38 | BLANK | 100 | 100 | Yes | NO | NO ITEM | | 0.75 | 0.18 | BLANK | BLANK | BLANK | 0.18 |
| DPR049 | | | | | | 3.3 | 3.3 | 1 | 1 | 157.83 | 157.83 | 142.05 | 142.05 | 86 | 125.5 | 60.54 | 88.35 | 0 Yes | No | NOT CLEAR | NOT CLEAR | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | 0.10177 |
| DPR050 | NO ITEM | NO ITEM | NO ITEM | NO ITEM | BLANK | - | BLANK | 1 | BLANK | 82.4 | BLANK | 57.6 | BLANK | 52.4 | BLANK | 91 | 91 | Yes | No | NOT CLEAR | NOT CLEAR | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | - |
| DPR051 | | | | | | 85.45 | 85.45 | NA | NA | 14170 | 14170 | 9717 | 9717 | 6298.59 | 6644 | 61.64 | 65.02 NA | | | NA | NA | NA | NA | NA | NA | 8.3271 |
| DPR052 | Uncleared | Uncleared | Uncleared | Uncleared | | 34.48 | 34.48 | Uncleared | Uncleared | 6120 | 6120 | 4362 | 4362 | 2875.5 | 3053.5 | 65.92 | 70 N.A. | Yes | Uncleared | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | 3.651525 |
| DPR053 | | | | | | 5.5 | 5.5 | NO ITEM | NO ITEM | NA | NA | 828.83 | 828.83 | 375 | 565 | 45.24 | 68.17 NA | Yes | No | NA | NA | NA | NA | NA | NA | 0.45 |
| DPR054 | | | | | | 5.5 | 5.5 | NO ITEM | NO ITEM | NA | NA | 398 | 398 | 133 | 239.56 | 33.62 | 60.19 NA | Yes | No | NA | NA | NA | NA | NA | NA | 0.21 |
| DPR055 | | | | | | 7.84 | 7.84 | NO ITEM | NO ITEM | 552 | 552 | 480 | 480 | 302.89 | 367.6 | 63.1 | 76.58 NA | Yes | No | NA | NA | NA | NA | NA | NA | 0.35 |
| DPR056 | Uncleared | Uncleared | Uncleared | Uncleared | | 11.31 | 11.31 | Uncleared | Uncleared | 1066.4 | 1066.4 | 947 | 947 | 533 | 622 | 56.28 | 65.68 N.A. | Yes | Uncleared | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | 0.6772 |
| DPR057 | | | | | | 10.95 | 10.95 | 5 | 5 | 303 | 303 | 242 | 358 | 242 | 358 | 80 | 118 - | Yes | No | NOT CLEAR | NOT CLEAR | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | - |
| DPR058 | | 0.796 | 0.769 | Uncleared | Uncleared | 42.54 | 42.54 | 15 | 15 | Blank | Blank | 5110 | 5110 | 2956 | 2957 | 57.847 | 57.867 N.A. | Yes | Uncleared | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | 0.68745 |
| DPR059 | Uncleared | Uncleared | Uncleared | Uncleared | | 0.74 | 0.74 | 19 | 19 | 1139 | 1139 | 968.85 | 968.85 | 512.35 | 872 | 52.88 | 90 | 0 Yes | Uncleared | Blank | Blank | Blank | Blank | Blank | Blank | Blank |
| DPR060 | Uncleared | Uncleared | Uncleared | Uncleared | | 22 | 22 | 3 | 3 | 547.82 | 547.82 | 390.43 | 390.43 | 351.39 | 351.39 | 90 | 90 N.A. | Yes | Uncleared | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | 0.39 |
| DPR061 | NOT CLEAR | NOT CLEAR | | | NOT CLEAR | NOT CLEAR | | 3 | 3 | 689 | 689 | 316 | 316 | NOT CLEAR | NOT CLEAR | NOT CLEAR | NOT CLEAR | NOT CLEAR | Yes | No | NOT CLEAR | NOT CLEAR | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEAR |
| DPR062 | Uncleared | Uncleared | Uncleared | Uncleared | | 10.95 | 10.95 | 3 | 3 | 410.76 | 410.76 | 389 | 389 | 312 | 312 | 80.001 | 80.206 N.A. | Yes | Uncleared | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | 0.68745 |
| DPR063 | Uncleared | Uncleared | Uncleared | Uncleared | | 21.8 | 21.8 | Uncleared | Uncleared | 1857 | 1857 | 1571.44 | 1571.44 | 707.72 | 864.3 | 45.04 | 55 N.A. | Yes | Uncleared | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | 1.05005 |
| DPR064 | Uncleared | Uncleared | Uncleared | Uncleared | | 6.36 | 6.36 | Uncleared | Uncleared | 740.15 | 740.15 | 444.98 | 444.98 | 267 | 400.48 | 60 | 90 N.A. | Yes | Uncleared | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | 0.3217 |
| DPR065 | | | | | | 6.1 | 6.1 | NO ITEM | NO ITEM | 295 | 295 | 253 | 253 | 47.8 | 144.5 | 18.89 | 57.1 NA | Yes | No | NA | NA | NA | NA | NA | NA | 1.05005 |
| DPR066 | Uncleared | Uncleared | Uncleared | Uncleared | | 4.05 | 4.05 | Uncleared | Uncleared | 295 | 295 | 226.72 | 226.72 | 67.9 | 139.3 | 27.56 | 14.44 N.A. | Yes | Uncleared | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | 0.2288 |
| DPR067 | | | | | | 5.42 | 5.42 | | | 423.2 | 423.2 | 391.5 | 391.5 | 167 | 261.5 | 34.9 | 66.8 NA | Yes | No | NA | NA | NA | NA | NA | NA | 1.05005 |
| DPR073 | NOT CLEAR | NOT CLEAR | | | NOT CLEAR | NOT CLEAR | NOT CLEAR | NOT CLEAR | NOT CLEAR | NOT CLEAR | NOT CLEAR | NOT CLEAR | NOT CLEAR | NOT CLEAR | NOT CLEAR | NOT CLEAR | NOT CLEAR | NOT CLEAR | NOT CLEA | NOT CLEAR | NOT CLEAR | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEAR |
| DPR068 | Uncleared | Uncleared | Uncleared | Uncleared | | 0 | 76.12 | 0 | 44 | 0 | 7550 | 0 | 7464 | 0 | 0 | 0 | 0 | 0 Yes | Uncleared | Blank | Blank | Blank | Blank | Blank | Blank | 0.01359 |
| DPR069 | | | | | | 48.57 NO ITEM | | 17 NO ITEM | | 6390 NO ITEM | | 58630 NO ITEM | | 4046 NO ITEM | | 69 NO ITEM | NA | Yes | No | - | - | - | - | - | - | 11.32 |
| DPR070 | | | | | | 25.44 | | 26 | - | | 6960 | | 5233.51 | 5623.85 | 75.19 | 81.24 | | 0 Yes | No | NOT CLEAR | NOT CLEAR | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | 160.2779 |
| DPR071 | | 1.95 | 1.95 | | | 110 | 110 | 51 | 51 | 10512 | 10512 | 9986 | 9986 | 7239.85 | 7239.85 | 72.5 | 85 BLANK | Yes | No | NOT CLEAR | NOT CLEAR | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEAR |
| DPR072 | Uncleared | Uncleared | Uncleared | Uncleared | | 3.96 | 3.96 | 5 | 5 | 486.04 | 486.04 | 414.01 | 414.01 | 298.09 | 372.61 | 72 | 90 Blank | Yes | Uncleared | Blank | Blank | Blank | Blank | Blank | Blank | Enclosed |

| | 12.1.2 | 12.2.1 | 12.2.2 | 12.3.1 | 12.3.2 | 12.4.1 | 12.4.2 | 12.5.1 | 12.5.2 | 12.6.1 | 12.6.2 | 12.7.1 | 12.7.2 | 12.8.1 | 12.8.2 | 12.9.1 | 12.9.2 | 13.1.1 | 13.1.2 | 13.1.3 | 13.1.4 | 13.1.5 | 13.2.1 | 13.2.2 | 13.3.1 | 14 | 15 | 16 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DPR036 | 25 | BLANK | BLANK | BLANK | 3.7 | BLANK | | 0 BLANK | 32 | BLANK | Fishery | | 0 | 0 | 0 | 0 | 0 | 0 | 1715.75 | 0 | 0 | 0 | 0 BLANK | | 1715.75 - | | NOT CLEAR - | | BLANK |
| DPR037 | BLANK | BLANK | BLANK | BLANK | BLANK | BLANK | BLANK | BLANK | BLANK | BLANK | BLANK | BLANK | BLANK | BLANK | BLANK | BLANK | BLANK | NOT CLEAR | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | 5265.87 | BLANK | BLANK | | | 0 | |
| DPR038 | BLANK | BLANK | BLANK | BLANK | BLANK | BLANK | BLANK | BLANK | BLANK | BLANK | BLANK | BLANK | BLANK | BLANK | BLANK | BLANK | BLANK | BLANK | BLANK | BLANK | BLANK | BLANK | BLANK | | 465 | 1.57 | BLANK | BLANK |
| DPR039 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 126.69 | 0 | 0 | 0 | 0 | 126.69 | | BLANK | 3.09 | NA | NO ITEM |
| DPR040 | 1.4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 NO ITEM | NO ITEM | 1.2 | 1.4 | 0 | 0 | 0 | 0 | 94.01 | 0 | 0 | 0 | 0 | 0 | | 0 0 | 7.04 | NA | NA |
| DPR041 | NO ITEM | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 155.38 | 0 | 0 | 0 | 0 | 155.38 | BLANK | 12.89896 | 2.23 | 1730 | NOT CLEAR |
| DPR042 | 0.15406 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 98.3 | NO ITEM | 0 | NO ITEM | 0 | NO ITEM | | 98.3 | 7.6544 | 1.98 | 1630 25 Years |
| DPR043 | | | | | | | | | | | | | | | | | | | | | | | | | | | 0 | |
| DPR044 | | | | | | | | | | | | | | | | | | | | | | | | | | | 0 | |
| DPR045-1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2285 | NA | NA | NA | NA | | 2285 - | | 311.02805 | 1.71 | 860 44798 |
| DPR045-2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2285 | NA | NA | NA | NA | | 2285 - | | 311.02805 | 1.71 | 860 BLANK |
| DPR047 | BLANK | - | BLANK | - | BLANK | - | BLANK | 25 | BLANK | - | BLANK | - | BLANK | - | BLANK | - | BLANK | BLANK | - | - | - | - | BLANK | BLANK | | 102.48096 | 1.744 | NOT CIEAR 9.96 |
| DPR048 | BLANK | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 166.83 | - | - | - | - | 47.66 | NO ITEM | | 17.59702 | 1.657 | 20 0.151 |
| DPR049 | 0.15317 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 94 | 0 | 0 | 0 | 0 | 94 | NO ITEM | | 7.02458 | 1.71 | 1720 1202854 |
| DPR050 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 80.32 | - | - | - | - | 14.46 | NO ITEM | | 0.776684 | 1.73 | 17 0.299 |
| DPR051 | 8.3271 | 0.12 | 0.12 | 0 | 0 | 0 | 0 | 4 | 4.5 | Fisheries | Fisheries | | 0 | 0 | 0 | 0 | 0 | 0 3509 | 0 | 0 | 0 | 0 | 0 | | 0 0 | 1.52 | 0 | |
| DPR052 | 3.651525 | | 0 | 0 | 0 | 0 | 0 | 2.5 | 2.5 | Uncleared | Uncleared | | 0 | 0 | 0 | 0 | 0 | 0 552 | 0 | 0 | 0 | 0 | 0 | | 0 Blank | 1.68 | 25.2 | Blank |
| DPR053 | 0.7 | | 0 | 0 | 0 | 0 | 0 | 0 10 | 10 | Fisheries | Fisheries | - | - | - | - | - | - | 304 | - | - | - | - | - | | BLANK | 2.1 | 1380 | - |
| DPR054 | 0.31 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 302.5 | - | - | - | - | - | | BLANK | 1.84 | 1030 | - |
| DPR055 | 0.54 | | 0 | 0 | 0 | 0 | 0 | 0 11 | 20 | Fisheries | Fisheries | - | - | - | - | - | - | 176.3 | - | - | - | - | - | | BLANK | 1.98 | 1160 | - |
| DPR056 | 0.78925 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 Uncleare | Uncleare | | 0 | 0 | 0 | 0 | 0 | 0 196.76 | 0 | 0 | 0 | 0 | 0 | | 0 0 | 2.13 | 12.3 | 0 |
| DPR057 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | | - | - | - | - |
| DPR058 | 0.80745 | | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 2 | Uncleared | Uncleared | | 0 | 0 | 0 | 0 | 0 | 0 7281.42 | 0 | 0 | 0 | 0 | 7281.42 | 7281.42 | Blank | 0.00071238 | 16.8 | |
| DPR059 | Blank | Blank | Blank | Blank | Blank | Blank | Blank | Blank | Blank | Blank | Blank | | 0 | 0 | 0 | 0 | 0 | 0 1293.56 | 0 | 0 | 0 | 0 | Blank | Blank | Blank | 1.5 | 10.5 | |
| DPR060 | 0.39001 | | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 2 | Uncleared | Uncleared | | 0 | 0 | 0 | 0 | 0 | 0 443.26 | 0 | 0 | 0 | 0 | 443.26 | 443.26 | Blank | 0.0007338 | 34 | Blank |
| DPR061 | NOT CLEAR | NOT CLEAR | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEAR | NOT CLEAR | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEAR | NOT CLEAR | NOT CLEAR | NOT CLEAR | NOT CLEAR | NOT CLEAR |
| DPR062 | 0.80745 | | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 245.3 | 0 | 0 | 0 | 0 | 245.3 | 245.3 | Blank | 0.00071991 | 12.1 | Blank |
| DPR063 | 1.05005 | 0.2 | 0.2 | 0 | 0 | 0 | 0 | 0 | 2 | 2 | Uncleared | Uncleared | | 0 | 0 | 0 | 0 | 0 | 0 485.9 | 0 | 0 | 0 | 0 | 485.9 | 485.9 | Uncleared | 1.62 | 21.5 | N.A. |
| DPR064 | 0.3217 | | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 2 | Uncleared | Uncleared | | 0 | 0 | 0 | 0 | 0 | 0 407.2 | 0 | 0 | 0 | 0 | 407.2 | 407.2 | Uncleared | 2.38 | 17.8 | N.A. |
| DPR065 | 1.05005 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 242.02 | 0 | 0 | 0 | 0 | | 242.02 | | 1.52 | 2180 NA |
| DPR066 | 0.2288 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | Uncleared | Uncleared | | 0 | 0 | 0 | 0 | 0 | 0 196.06 | 0 | 0 | 0 | 0 | 196.06 | 196.06 | Blank | 1.58 | 18.3 | N.A. |
| DPR067 | 1.05005 | | | | | | | | 2 | 2 | Fisheries | Fisheries | - | - | - | - | - | - | 168.68 | - | - | - | | 168.68 | | | 2.01 | 2740 | NA |
| DPR073 | NOT CLEAR | NOT CLEAR | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEAR | NOT CLEAR | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEAR | NOT CLEAR | NOT CLEAR | NOT CLEAR | NOT CLEAR | NOT CLEAR |
| DPR068 | 0.01359 | Nil | Nil | Nil | Nil | Nil | Nil | Blank | Blank | Uncleared | Uncleared | | 0 | 0 | 0 | 0 | 0 | 0 1359 | 0 | 0 | 0 | 0 | Blank | Blank | 171.18 | 0 | 0 | 0 |
| DPR069 | NO ITEM | - | NO ITEM | - | NO ITEM | - | NO ITEM | 6.92 | NO ITEM | NOT CLEA | NOT CLEA | NA | NO ITEM | NA | NO ITEM | NA | NO ITEM | 995 | NA | NA | NA | NA | NO ITEM | NO ITEM | NO ITEM | NO ITEM | NO ITEM | NO ITEM |
| DPR070 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NOT CLEAR | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEAR | NOT CLEAR | NOT CLEAR | 1.86 | 3410 | NO ITEM |
| DPR071 | NOT CLEAR | NOT CLEAR | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEAR | NOT CLEAR | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEA | NOT CLEAR | NOT CLEAR | NOT CLEAR | 1.64 | NOT CLEAR | NOT CLEAR |
| DPR072 | Enclosed | Enclosed | Enclosed | | 0 | 0 | 0 | 0 | 0 | 0 Uncleared | Uncleared | Blank | Blank | Blank | Blank | Blank | Blank | 238.82 | 0 | 0 | 0 | 0 Blank | | Blank | 238.82477 | 1.82 | 11.9 | Blank |

# *Attachment 4.2*
# *Comments on Selected Sample DPRs of Sub-projects Proposed under RWSLIP*

**Attachment 4.2: Comments on Selected Sample DPRs of Sub-projects Proposed under RWSLIP**

WRD formulated sample DPRs for 73 sub-projects which are proposed under RWSLIP. After preliminary screening, JICA survey team has shortlisted 29 sub-projects (list at annexure – 1) for critical examination. Out of these, 10 are medium, 7 minor and 12 sub-projects pertain to north zone. Comments on most DPRs were communicated to concerned field officers for compliance.

During technical scrutiny of selected DPRs, it has been observed that the documents have not been formulated in proper manner and important data / details are not based on proper investigation and appears to be arbitrary. It is a fundamental requirement that the deficiencies based on diagnostic analysis are to be assessed with the co-operation of beneficiaries (Walk through survey with beneficiaries). Accordingly, dam and canals are to be re-designed after considering all factors and based on provisions contained under Indian Standards so that the dam and other structures as well as canal network can perform efficiently after rehabilitation.

It has been observed that the concept of SID has not been followed sincerely as per set guidelines. There is no input of deficiencies expressed by the farmers who have experienced the real problems in regulation and running of canal system. Moreover the basic survey about submergence and command has not been done without which it is difficult to estimate the actual capacity of the reservoir and details of available command area. As dams are very old, the capacity must have reduced due to siltation/ sedimentation coupled with deforestation. Similarly the command must have been reduced due to urbanization, industrialation and use of land for other social purposes. There are large numbers of un-authorized outlets which have to be assessed under walk through surveys and accordingly revised chak planning is also required.

Selected DPRs do not contain above parameters / designs based on actual surveys, and cannot be considered suitable for proposing under this project. It is suggested that the DPRs may be re-examined and be rectified. However the important issues are listed below: -

**Important Issues**

1. The DPR should be prepared in conformity with the model DPR prepared by the JICA survey team.
2. The DPRs for the sub-projects pertaining to north zone contain general description of the Bhakra/Gang canal system as a whole. The details of the part of Bhakra/ Gang system proposed under specific sub-project are totally missing from the DPR except under cost estimation part.
3. Hydrology of the project should be reviewed based on actual performance of the sub-project and Peak flood discharge should be worked out based on unit hydrograph method. It has been noted that in some of cases although PMF based on unit hydrograph has been worked out and attached with the DPR, but adequacy of surplussing capacity to accommodate the designed PMF of sub-project has not been established.
4. The availability of water and performance pertaining to canal systems of north zone, Mahi, Gurgoan canal, Bhartpur Feeder and Chambal, should be considered based on actual supplies during last 25 years as compared to designed requirements of the individual sub-project. Actual irrigation intensity achieved should invariably be incorporated in DPR which would indicate the actual dependability of the system proposed under rehabilitation.
5. As per DPRs for sub-projects pertaining to North zone, the actual intensity of irrigation has been observed as more than the designed as well as now proposed intensity as indicated below in table -1.

Table – 1

| Particulars | Gang canal System | | | Bhakra canal system | | |
|---|---|---|---|---|---|---|
| | % of CCA during | | | % of CCA during | | |
| | Kharif | Rabi | Total | Kharif | Rabi | Total |
| Planned Originally | 24 | 36 | 60 | 25 | 37 | 62 |
| Actual achieved | 37 | 48 | 85 | 39 | 50 | 89 |
| Proposed | 35 | 44 | 79 | 35 | 44 | 79 |
| Reduction in comparison to actually achieved | 2 | 4 | 6 | 4 | 6 | 10 |
| Cropping pattern adopted in table 6.1 & 6.2 of EIRR for pre rehabilitation | 60 | 60 | 120 | NA | NA | NA |
| Cropping pattern adopted in table 6.1 & 6.2 of EIRR for post rehabilitation | 79 | 79 | 158 | NA | NA | NA |

If with the present deteriorated condition of canal system, the 85 % intensity of irrigation has already been achieved, then why rehabilitation and modernization works is required in order to achieve irrigation intensity of 79 % only. Moreover these figures are for the project as a whole. Actual achievements in the command area under specific sub-project should have been indicated based on data of actual cropping pattern during last 25 years.

6. While working out BC ratio, intensity of irrigation during the pre rehabilitation period has been adopted as per original designed intensity whereas it should be based on actually achieved intensity of irrigation in order to assess the real benefits after rehabilitation works.
7. There is anomaly the figures of irrigated area adopted for BC ratio calculations and mentioned at other places in DPR.
8. Micro irrigation in part of the command area particularly in tail portion should be encouraged and incorporated in the project report.
9. Crop water requirement has been worked out based on 'New Penman Montheit method' which should have been used for accessing the water requirement of subproject and for fixing capacity of canal system. Contrary to this, the canal capacity has been worked out based on conventional duty in case of sub-projects under WRD zones and in case of Gang and Bhakra systems the canal duty has been adopted as per prevailing practices which needs to reviewed and corrected.
10. ICA should be worked out on the basis of crop water requirement and availability of dependable yield/ supplies.
11. Cropping pattern should be revised in consultation with DoA and BC ratio should be certified by DoA.
12. Walk through survey should be carried out with WUAs / beneficiaries for correct diagnosis of the deficiencies of the system. The proposed rehabilitation works should be discussed with WUA and its consent is required. While discussing with WUAs, special care needs to be taken to ensure that position of outlets is such that the beneficiaries can irrigate their land without any problem. Otherwise, problem of cutting banks and putting cross bunds would again crop up.
13. Submergence survey should be carried out to assess the extent of silting and present capacity (dead / live/ gross) of the reservoir. Capacity curve should be attached.
14. Command area survey should be carried out in order to revise the chak planning, location of outlets and correct assessment of the command area thereby revision of the canal L- Section and cross-sections along with draw off statement.
15. Sajra sheet of the command area should be attached indicating location of chaks, outlets, contours, GCA, CCA and un-command area.

16. Detailed surveys should be carried out for canal system to assess the present condition of the system including the identification of the locations of seepage, expansive soils, identification of structures to be repaired and or other allied problems.
17. The local BM should be connected with the GTS Bench Mark.
18. Chak wise list of beneficiaries indicating name of beneficiaries, village covered and area under command should be attached. Details should have specific mention regarding SC /ST and women beneficiaries.
19. Population benefitted should be indicated and should be based on census 2011
20. Canal design calculations and draw off statement should be attached from head to tail of the system.
21. Design and detailed drawings for structures on canal requiring major repair should be attached which should form basis of estimate.
22. The estimates should be prepared at current rates and no escalation is to be added since separate provision for escalation is being taken under the RWSLIP.
23. There is ban from the government for lining of canal. Instead of lining the whole length of the canal, provision for lining of only venerable reaches should be taken after approval from the competent authority.
24. There must be consistency in the data provided at various sections of DPR.
25. Soil survey is being conducted by DoA/ Watershed Department. Local offices of DoA/ Watershed Department should be contacted to obtain the latest soil survey report for the area.
26. Free Board in the canal should be kept as per provisions of BIS 10430.
27. Provision should be taken for construction of cattle ghats and bathing ghats at suitable places on the canal.
28. L-sections of canal should also contain existing / proposed parameters.
29. Report indicates that efficiency of the existing system has been assessed but no details have been attached, which should now be attached.
30. The top width of dam should be kept as 6.0 m in case of large dams.
31. The stability of earthen dam and spillway portion should be checked as per guidelines of BIS codes.
32. The waste weir should be checked for its adequacy of discharging capacity and its stability.
33. Provision should be taken for construction of WUA office buildings along with furniture, if already not constructed.
34. Provision for buildings other than WUA office building should not be incorporated in the DPR.
35. Provision should be taken in the estimate for removal of unauthorized outlets from the canal system with due consultation with WUAs/ beneficiaries.
36. The demand for drinking water supply and industrial use is continuously increasing; as such a provision for use of part of the storage should be reserved for the drinking water supply and industrial use.
37. The rehabilitation works on sub-projects are proposed to be completed in shorter spans varying from 1 to 3 years. However, construction program should be formulated based on availability of working period keeping in view monsoon season, availability of water in the reservoir, and canal running periods.
38. Provision should be taken for chute drains and longitudinal drains on downstream slope of the embankment.
39. A tree chart for canal system should be attached indicating the lined and unlined channels, lining done under RWSRP, and /or other projects and now proposed under RWSLIP.
40. Analysis of Rate should be attached.
41. Inventory of existing and proposed cross-drainage works, VRBs, DRBs, outlets should be attached.
42. Provision should be taken for lining of water courses in initial length of 15 to 20 m.
43. All data should be in SI unit.

44. The dam and canal cross-sections should be dimensioned, leveled and complete cross-sections indicating existing and proposed works at regular interval should be attached.
45. Existing and proposed downstream protection works should be indicated in the relevant drawings.
46. Measuring device and tail cluster should be considered and marked on the drawing, if necessary.
47. Block level plan of the surplussing area indicating contours, layout of EDA (existing and proposed) and appurtenances works should be attached.
48. Thickness of CC lining should be taken as per provisions contained in BIS 3873.
49. As far as possible mechanized lining should be adopted for better results and durability considerations.
50. Location of VRBs and other structures to be repaired should be indicated and estimate should be based on detailed drawing.
51. Regulators and cross regulators/ un-gated dividers should be provided at distributor / minor off-take points and estimates should be based on detailed design and drawings.
52. Provision for prorate; capacity building etc. should not be included in the DPR.
53. While preparing the DPRs, provisions should be based on recommendations by consultants (study on planning of water resources in Rajasthan – by Tahal, bench marking report by WAPCOS, or any other similar study reports).
54. There is anomaly in the figures of catchment area, interceptions of catchment area provided in DPR and Tahal report. The catchment area of the project should be reassessed in view of interceptions after construction of project.
55. Since pitching exists on the upstream slope of the dam, it would be better to lay earthen lamina on downstream slopes only. For proper bond between existing earthen dam and newly added soil, provision for step cutting should be incorporated in the estimate.
56. In case of canal reaches having swelling soils, provision for CNS treatment should be taken as per provisions contained in BIS code 9451-1994. To avoid slipping and rain cuts during the rainy season, it is advisable to provide CNS right up to the ground level. In deep cuts CNS material should be provided not only behind the lining of the canal but also above the canal prism, all along the excavated surface, so as to prevent large scale heaving above the canal level. The CNS material above the canal prism may be of lesser thickness, say 15 to 20 cm, However, full\design thickness behind the lining should be continued at least 100 cm above the top level of the lining (illustrative arrangement shown in Fig. 1).

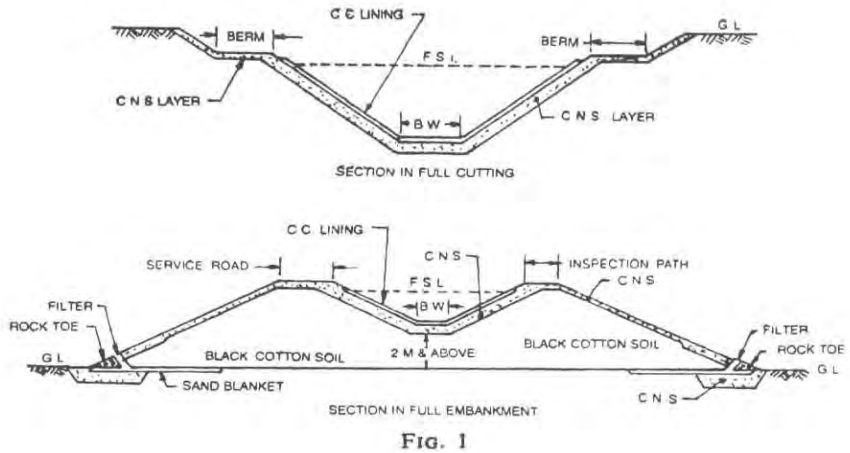



FIG. 1

57. DPR reveals that most of part of existing lined canal is proposed to be replaced by new lining. This may be reviewed.

58. Similar is the status of removal of existing pitching and replacement by new pitching.
59. Information regarding Environment and social impact should be provided with DPR in formats attached in model DPR.
60. Index map, existing layout plan of head work and appurtenances with super imposed proposed changes should be attached.
61. The checklist attached with DPRs does not contain relevant information and references.

**Annexure – 1**

**Selected Sample DPRs**

| S. No | Name of sub-project | CCA covered in ha | Estimated cost as per DPR (INR in Lac) |
|---|---|---|---|
| A | **Medium Irrigation Projects** | | |
| 1 | Rehabilitation of Canal System of Kalisil Dam | 4,903 | 1,329 |
| 2 | Rehabilitation of Dheel Irrigation Project | 5,943 | 3,836 |
| 3 | Rehabilitation of West Banas Irrigation Project | 7,952 | 1,716 |
| 4 | Rehabilitation of Galvania Medium Irrigation Project | 2,257 | 980 |
| 5 | Rehabilitation of Abhaypura Bimlat Medium Irrigation project | 3,402 | 2,285 |
| 6 | Rehabilitation of Burdha Medium Irrigation project | 4,274 | 1,093 |
| 7 | Renovation of Kothari Medium Irrigation Project | 4,362 | 547 |
| 8 | Rehabilitation of Parwan Medium Irrigation Project | 7,464 | 1,359 |
| 9 | Rehabilitation of Bilas Medium Irrigation project | 5,863 | 995 |
| 10 | Rehabilitation of Bhimsagar Medium Irrigation Project | 9,986 | 6,505 |
| 11 | Rehabilitation of Karniji Disty and its system | 9,058 | 1,700 |
| 12 | Rehabilitation of H.H. Disty from RD 0 to 35.845 | 5,494 | 597 |
| 13 | Rehabilitation of LNP Disty and its system | 2,673 | 462 |
| 14 | Rehabilitation of PS Disty and its system | 9,834 | 377 |
| 15 | Rehabilitation of Sameja Disty and its system | 5,521 | 289 |
| 16 | Rehabilitation of Farm Minor from RD 26.135 to 40.545 | 4,301 | 197 |
| 17 | Rehabilitation of PBN Distributary from Km 0 to 34.217 of Bhakra canal system | 9,443 | 5,228 |
| 18 | Rehabilitation of NTW km 0 to 8.36, BKW km 0 to 3.40, KNJ Mr. Km 0 to 2.04, DBL Mr. Km 0 to 1.86 & SGM km 0 to 15.85 of Bhakra canal system | 9,906 | 2,492 |
| 19 | Rehabilitation of Bhagsagar Sub Mr. (BGSM) Minor from km 0 to 3.20 & KRW km 0 to 14.00 & Sadulshahar Sub Mr. Km 0 to 2.26 of Bhakra canal system | 4,568 | 1,881 |
| 20 | Rehabilitation of of Sabuna Distributary from Km 0 to 17.777 & Nagrana distributory 0.00 to 6.614 of Bhakra canal system | 6,524 | 1,807 |
| 21 | Rehabilitation of of Manaksar Distributary from Km 0 to 14.264 & Daulatpura Minor 0.00 to 7.103 of Bhakra canal system | 7,050 | 1,798 |
| 22 | Rehabilitation of Hanumangarh Distributary from km 0 to 20.269 (Tail) of Bhakra canal system | 8,616 | 2,285 |
| B | **Minor Irrigation projects** | | |
| 23 | Rehabilitation of Mansarovar Irrigation Project | 843 | 239 |
| 24 | Rehabilitation of Phulad Minor Irrigation Project | 787 | 527 |
| 25 | Rehabilitation of Damti Kokra Minor Irrigation Project | 947 | 197 |
| 26 | Rehabilitation of Som Pick Up Weir Medium Irrigation Project | 969 | 1,294 |
| 27 | Rehabilitation of Sei Pick up Weir canal system | 390 | 443 |
| 28 | Rehabilitation of Somi Irrigation Project | 445 | 407 |
| 29 | Rehabilitation of Borda Minor Irrigation Project | 414 | 239 |
| | | 144,192 | 43,103 |

*Attachment 4.3*

*Model DPR*

*Attachment 4.4*

*Simple Guideline for Preparation of DPR*

*Attachment 4.5*

*Simple Check List for Review of DPR*

**Water Resource Department (WRD),**
**The State of Rajasthan, Republic of India**

# DETAILED PROJECT REPORT
# ON
# REHABILITATION OF WEST BANAS IRRIGATION SUB-PROJECT

# Volume-1:REPORT

**August 2016**

**Rajasthan Water Sector Livelihood Improvement Project (RWSLIP)**

**Sub-PMU 3 for Udaipur and Jodhpur Zones**

# Preamble

(1) This Detailed Project Report was jointly prepared by WRD and JICA survey team in accordance with the scope of the works for preparatory survey on Rajasthan Water Sector Livelihood Improvement Project in India.

(2) This Detailed Project Report was prepared based on the available data and information provided from WRD as of 10 June 2016.

(3) This Detailed Project Report has not been the "Final" one due to the following constraints:

i) Walk-through survey among WRD staff, DoA staff, DoH staff, WCD staff, WUA members, Women Wing members, the consultant and NGO staff has not been conducted yet.
ii) No description and consideration for specific activities under RWSLIP such as "introduction of WUA constructive facilities" and "support for women friendly activities".
iii) Difficulties of finalization of re-design of irrigation canal system due to lack of survey data especially of command area survey.
iv) Lack of considerable number of drawings especially for structures and gates.
v) Insufficient studies and cooperation with DoA and WUA for agricultural / farming aspects especially of preparation of updated cropping pattern.
vi) Insufficient consideration for environmental and social aspects

(4) This Detailed Project Report, therefore, should be finalized before proceeding to next step, i.e. preparation of technical estimate.

(5) For revision and finalization of this Detailed Project Report, the following guidelines / manuals and "Notes for Preparation of DPR under RWSLIP" as shown below.

# Guidelines/Manuals and Notes for Preparation of Detailed Project Report

## (1) General

The following guidelines and manuals are available for reference of preparation of DPRs:

i) Manual for SID Works for Rehabilitation of Minor Irrigation Schemes prepared under RAJAMIIP, and
ii) Guidelines for Preparation of Detailed Project Reports of Modernisation of Irrigation Projects issued by Central Water Commission.

Basically, DPR should be prepared in accordance with the above guidelines and manuals though especially for Manual for SID Works for Rehabilitation of Minor Irrigation Schemes prepared under RAJAMIIP, the consultant for RWSLIP should review and update to be suitable for RWSLIP.

In addition to the above guidelines and manuals, the following specific aspects should be noted for preparation of DPRs under RWSLIP.

## (2) Notes for Preparation of Detailed Project Report under RWSLIP

Component 1: Participatory Irrigation Rehabilitation Works of RWSLIP consists of the following four sub-components:

i) Sub-component 1-1: Rehabilitation of irrigation facilities
ii) Sub-component 1-2: Promotion of micro irrigation system
iii) Sub-component 1-3: Introduction of WUA constructive facilities
iv) Sub-component 1-4: Support for women friendly activities

General work flow of Component-1: Participatory Irrigation Rehabilitation Works consisting the above four sub-components is shown in the figure in next page.

Among the activities shown in the Figure P.1, the following aspects are deeply concerned for preparation of DPR:

i) Orientation and selection of facilities for WUA constructive facilities
ii) Orientation for support for women friendly activities
iii) Walk-through survey
iv) Preparation of Command Area Micro Plan (CAMP) for soft component
v) Preparation of Detailed Project Report (DPR)

### (a) Orientation and selection of facilities for WUA constructive facilities

After selection of candidate irrigation sub-projects by PMU and before walk-through survey, sub-PMU will organize orientation for WUA members regarding Sub-component 1-3: introduction of WUA constructive facilities. Main agenda of orientation will be as follows:

**Table P.1 Orientation for Introduction of WUA Constructive Facilities**

| Trainer | Trainee | Contents |
|---|---|---|
| Sub-PMU (district level) / Consultant | Sub-PMU staff (field level)<br>NGO staff (field level)<br>WUA members | - Basic concept of introduction of WUA constructive facilities under RWSLIP (improvement of ownership, income generation activities)<br>- Project support and conditions for application (no compensation for required land and O&M activities)<br>- Sample of facilities and benefit expected from each facility<br>- Discussions for selection of type of the facilities |

*Source: JICA Survey Team*

For gender mainstreaming in WUA activities, views and opinions from members of women wing should be fully considered and reflected for the above selection of type of the facilities.

It is noted that for the irrigation sub-projects rehabilitated under RAJAMIIP or RWSRP, WUA office building has been already constructed and no WUA constructive facilities will be provided unless otherwise approved by PMU.


**Figure P.1 General Work Flow of Participatory Irrigation Rehabilitation Works**

### (b) Orientation for Women Wing and Representatives of WUA

After selection of candidate irrigation sub-projects by PMU and before walk-through survey, sub-PMU will organize orientation for members of women wing and representatives of WUA regarding sub-component 1-4: support for women friendly activities. Main agenda of orientation will be as follows:

**Table P.2 Orientation for Support for Women Friendly Activities**

| Trainer | Trainee | Contents |
|---|---|---|
| Sub-PMU (district level) / Consultant | Sub-PMU staff (field level)<br>NGO staff (field level)<br>WUA members | - Objective and target goal of women friendly activities (trigger for active movement of women wings in WUA, reduction of workload and increase of income generation)<br>- Project support and conditions for application (no compensation for |

| | | |
|---|---|---|
| | | required land, acknowledgement of representative of WUA and responsible for O&M activities)<br>- Sample of facilities and trees and benefit expected from each facility and tree<br>- Discussions for selection of type of the facilities and trees |

*Source: JICA Survey Team*

### (c) Walk-through survey

Walk-through survey to confirm the current condition of the irrigation facilities and possible countermeasures should be conducted among sub-PMU officers, WUA members including women wing, SID consultant, the consultant and NGOs.

During the walk-through survey, the following aspects should be also confirmed:

**WUA constructive facility**

Walk-through survey to confirm and determine the location and details such as size and specifications of the proposed facility selected in orientation should be conducted among sub-PMU officers, WUA members including women wing, SID consultant, the consultant and NGOs.

**Women friendly facilities and trees**

Walk-through survey to confirm and determine the location and details such as size and specifications of the proposed facility selected in orientation should be conducted among sub-PMU officers, members of women wing, representatives of WUA, SID consultant, the consultant and NGOs.

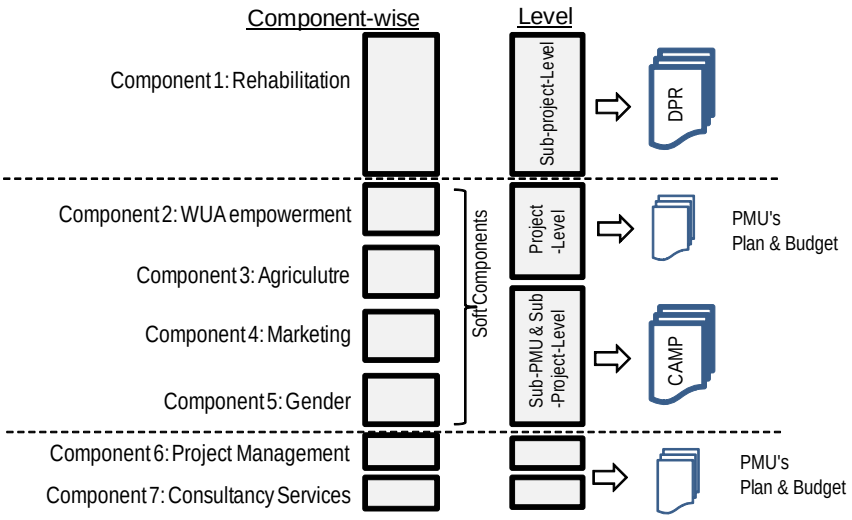
### (d) Preparation of Command Area Micro Plan (CAMP) report for the soft components

CAMP report will be formulated and describe the proposed "soft component" activities in the Sub-PMU. CAMP shall cover the project activities at the Sub-PMU-Level and the Sub-Project Level.

CAMP report should include following contents:

- List of specific activities and its cost by the Sub-Project-Level
- List of specific activities and its cost by the Sub-PMU-Level
- Implementation schedule
- Implementation structure

To facilitate understanding, the schematic image of those demarcation, category and the plans which should be in DPR and CAMP, is depicted in the following figure precisely.




*Source: JICA Survey Team*

**Figure P.2 Demarcation of Activities**

An construction cost for a single sub-project for component-1, i.e. Participatory Irrigation Rehabilitation Works, should be estimated and obtained in DPR through the SID works. In the same manner, activity cost for the soft components, i.e. Component-2, 3, 4, and 5, should be estimated in CAMP.

CAMP will be prepared in parallel with DPR and summary of CAMP should be incorporated into a part of DPR to facilitate the understanding of soft component activities at field level officers.

### (e) Special notes for preparation of DPR

#### 1) Construction planning

Considering the lessons learnt from RAJAMIIP especially of delay of the construction works, the following aspects should be clearly described in Detailed Project Reports under RWSLIP:

#### a) Packaging of the contract for construction works

Basic concept of packaging of the contract for construction works under RWSLIP is as follows:

- Minimum amount for one contract package: INR 30 mil.
- Basic amount for one contract package: INR 50 mil. ~ 100 mil.
- Maximum amount of one contract package: INR 200 mil.

In case size of one irrigation sub-project is smaller than the above minimum amount, merging of sub-project with another sub-project is recommended to attract the maximum participation from capable contractors and reduction of administrative burden of contract management. Meanwhile, in case size of one irrigation sub-project is larger than the above maximum amount, dividing of such sub-project into several contract packages is recommended to avoid unrealistic construction plan

#### b) Construction schedule

Taking into consideration the flow chart in Figure P.1, the construction schedule should be prepared for monitoring of pre-construction and construction works.

#### c) Organizational structure for construction works

Organizational structure for construction works should be clearly described including WRD, the consultant and the contractor.

#### d) Construction management and supervision

In principle, "Guideline for Construction management and Supervision under RWSLIP" issued by PMU will be applied to overall construction management and supervision including process of each activity, progress control, quality control and safety control. For proper construction management and supervision, the following regular and special construction meetings will be organized by relevant responsible sub-PMU staff under the Sub-project:

**Table P.3 Regular and Special Construction Meetings**

| Name | Frequency | Chairman | Member | Main agenda |
|---|---|---|---|---|
| Sub-PMU coordination committee | monthly | Superintending engineer | - Executive engineers<br>- Consultant<br>- Contractor (with delay or problem) | - report to sub-PMU about progress, quality and safety issues<br>- discussion and decision for important issues especially for delay of the works |
| Monthly construction meeting | monthly | Executive engineer | - Assistant engineers<br>- Consultant<br>- Contractor (project manager level) | - progress, quality and safety of the works<br>- decisions for required actions such as show cause meeting, warning letter, variation order, extension of time, contract amendment, etc. |
| Weekly constriction meeting | weekly | Assistant engineer | - Junior engineers<br>- Contractor (site manager level) | - progress, quality and safety of the works<br>- discussion for required actions such as show cause meeting, warning letter, variation order, extension of time, contract amendment, etc. |
| Special meeting | as required | Superintending engineer | - Executive engineers<br>- Consultant<br>- Contractor (project manager level) | - specific issues for discussion (delay of the works, low quality of the works, etc.) |

**2) Environmental and social consideration**

Screening and categorization based on JICA guideline for environmental and social consideration should be before preparation of DPR.

Based on the result of screening and categorization, required actions should be studied and taken by WRD and the results and monitoring plan should be clearly described in DPR, if any.

**(f) Authentication / Verification (Minutes of Sub-PMU Coordination Committee)**

All the contents of DPR should be confirmed in sub-PMU coordination committee and acknowledged by the representatives of the relevant agencies. Such acknowledgement should be confirmed as Minutes of Sub-PMU Coordination Committee and incorporated into a part of DPR.

**Authentication / Verification (Minutes of Sub-PMU Coordination Committee)**

Date: xxxxxxxxxx
Venue: xxxxxxxxx

In sub-PMU coordination committee on xxxxxx, contents of Detailed Project Report (DPR) prepared by SID consultant of xxxxxxx were discussed and confirmed among all the concerned agencies as follows:

**WRD:**

1. All the survey, investigation, design, cost estimate, construction planning and economic evaluation were made in conformity to the applicable guidelines, Indian Standards, badic schedule of rate, etc. established by Central Water Commission (CWC), Rajasthan Water Resources Department and PMU of RWSLIP, and
2. WRD staff of sub-PMU will make necessary effort for approval of this DPR.

**DoA and DoH:**

1. Present cropping pattern, i.e. without rehabilitation, was prepared in conformity to the actual site conditions,
2. Cropping pattern, calendar and crop water requirement after rehabilitation were prepared and calculated in conformity to final irrigation plan including canal maintenance period, latest soil survey result, climatic conditions, farmers views and opinions and command area micro plan (CAMP) of soft components for RWSLIP, and
3. Crop budget and income were estimated based on latest data and information available in DoA and DoH.

**WCD:**

1. Women friendly facilities and trees were planned in conformity to women wing's view and opinions and command area micro plan (CAMP) of soft components for RWSLIP.

**WUA:**

1. Planning and design in DPR were made based on walk-through survey dated on xxxx and WUA has no objection.

**Women Wing:**

1. Planning and design especially for women friendly facilities and trees in DPR were made based on walk-through survey dated on xxxx and women wing has no objection.

The parties hereto mutually agreed and signed this Minutes of Sub-Coordination Committee.

| | | |
|---|---|---|
| Water Resources Department | Department of Agriculture | Department of Horticulture |
| _____ | _____ | _____ |
| Superintending Engineer<br>Sub-PMU xxxxxxxx | Deputy Director | Deputy Director |
| Department of Women and Child Development | Water User's Association | Women Wing |
| _____ | _____ | _____ |
| Deputy Director | President | Leader |

# Detailed Project Report

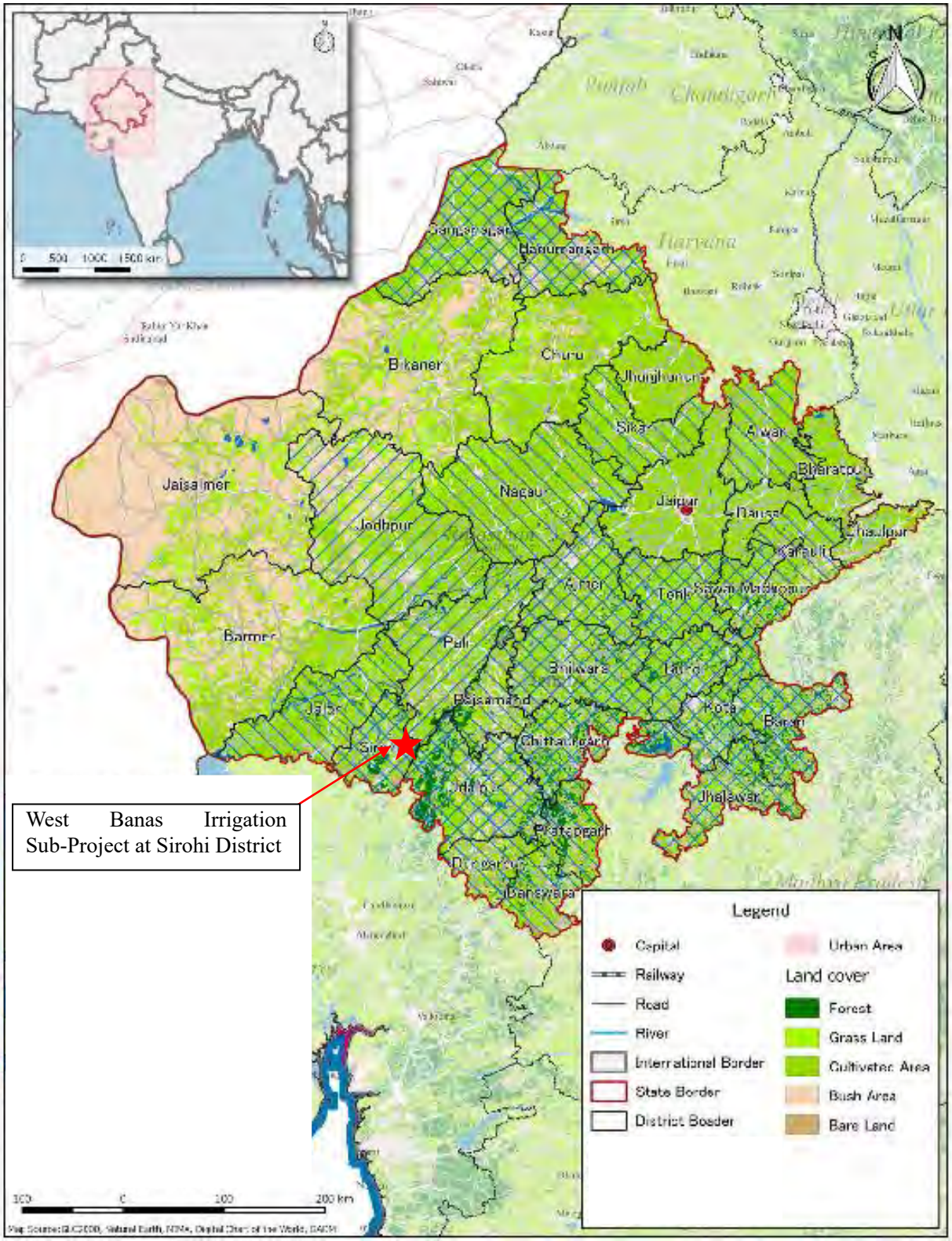
## Rehabilitation of West Banas Irrigation Sub-project

## List of Volumes

***VOLUME-1 REPORT***

***VOLUME-2 COST ESTIMATES***

***VOLUME-3 DRAWINGS***




**Location Map of the Sub-project**

**West Banas Dam (repair of dam body and filter toe, provision of quarry spalls, etc.)**

**Main Canal (to be rehabilitated)**

**Aqueduct (flume to be replaced)**

**Fall with VRB (to be rehabilitated)**

**Outlet (to be rehabilitated)**

**Photographs of the Sub-project Area**

# *Executive Summary*

## Key Features for Application to Project Support under RWSLIP

Name of sub-project: Rehabilitation of West Banas Irrigation Sub-project
Location of sub-project: Sirohi District, Pindwara/Aburoad Tehsil

| No. | Descriptions | Unit | Existing | Proposed | Refer to |
|---|---|---|---|---|---|
| 1 | Gross command area (GCA) | ha | 9,848 | 9,848 | Section-2 |
| 2 | Culturable command area (CCA) | ha | 7,952 | 7,952 | Chapter 5 |
| 3 | Annual irrigation (AI) | ha | 2,704 | 6,203 | Chapter 4 |
| 4 | Intensity of irrigation (% of CCA) | % | 34 | 78 | Chapter 4 |
| 5 | Year of construction | year | 1963 | - | - |
| 6 | Rehabilitation records (RWSRP and/or RAJAMIIP) | - | RWSRP | - | - |
| 7 | Free catchment area | km2 | 414.40 | 414.40 | Chapter 2 |
| 8 | 50% dependable annual rainfall | mm | No data | 783.00 | Chapter 2 |
| 9 | 50% dependable annual runoff | MCM | No data | 26.04 | Chapter 2 |
| 10 | Annual irrigation demand (including all losses) | MCM | 36.22 | 21.00 | Chapter 4 |
| 11 | Other demand | MCM | No data | 1.41 | Chapter 4 |
| 12 | Dependability | % | No data | 50 | Chapter 4 |
| 13 | Live storage of reservoir | MCM | 36.22 | 35.80 | Chapter 3 |
| 14 | Elevation of top of dam | m | 337.04 | 337.04 | Chapter 3 |
| 15 | Design discharge of head of canal (left main canal) | m3/s | No data | xxx | Chapter 5 |
| 16 | Design discharge of head of canal (right main canal) | m3/s | No data | xxx | Chapter 5 |
| 17 | Major crop (Wheat) | ha | 954 | 1,352 | Chapter 4 |
| 18 | Major crop (Mustard) | ha | 795 | 1,988 | Chapter 4 |
| 19 | Major crop (Barley) | ha | 398 | 0 | Chapter 4 |
| 20 | Major crop (Gram) | ha | 398 | 1,511 | Chapter 4 |
| 21 | Major crop (Others) | ha | 159 | 1,352 | Chapter 4 |
| 22 | Estimated cost (Total) | INR mil. | - | xxx | Volume 2 |
| 23 | Estimated cost (Rehabilitation of dam) | INR mil. | - | xxx | Volume 2 |
| 24 | Estimated cost (Rehabilitation of canal and structures) | INR mil. | - | xxx | Volume 2 |
| 25 | Estimated cost (Others) | INR mil. | - | xxx | Volume 2 |
| 26 | Economic Internal Rate of Return (EIRR) | % | - | xxx | Chapter 9 |

Remarks:

i) For environmental and social aspects: see Chapter 8 of main report,
ii) For WUA, agriculture and farming aspects, food processing and marketing aspects: see Command Area Micro Plan (CAMP) for soft components.

## Summary of Result of Walk-through Survey

1. For rehabilitation of irrigation facilities

   Date: xxxxxxxxxxx

   Participants: xxxxxxxxxxx

| No. | Location | Findings | Countermeasure |
|---|---|---|---|
| 1 | Dam body | Heavy jungle | To be removed |
| 2 | Dam body | Insufficient top width and damaged slope at downstream | To be remedied |
| 3 | Dam body | Seepage at xxxxx and top parapet wall is damaged | To be remedied |
| 4 | Dam Spillway | Downstream wall at settling basin is damaged | To be repaired |
| 5 | Intake (Dam) | Seepage due to damaged wall and gates | To be repaired |
| 6 | Canal | Canal lining for main canals is damaged at many locations | To be repaired |
| 7 | Canal | Canal passing abadi area is closed due to wastage | To be covered |
| 8 | Canal | No lining for some reaches of minor canals | To be lined |
| 9 | Structures | Damages for VRB, Aqueduct, Siphon and Falls | To be repaired |
| 10 | Structures | Many unauthorized outlets | To be removed |
| 11 | Structures | Lack of washing steps and foot paths | To be constructed |

2. For WUA constructive facilities

   Date: xxxxxxxxxxx

   Participants: xxxxxxxxxxx

   Date of orientation: xxxxxxxxxxx

   Type of facilities: xxxxxxxxxxx

   Location of facilities: xxxxxxxxxxx

   Findings and remarks: xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx

3. For women friendly facilities

   Date: xxxxxxxxxxx

   Participants: xxxxxxxxxxx

   Date of orientation: xxxxxxxxxxx

| No. | Location | Type of Proposed Facility | Remarks |
|---|---|---|---|
| | | | |
| | | | |
| | | | |
| | | | |

4. For women friendly trees

   Date: xxxxxxxxxxx

   Participants: xxxxxxxxxxx

   Date of orientation: xxxxxxxxxxx

| No. | Location | Type of Proposed Tree | Remarks |
|---|---|---|---|
| | | | |
| | | | |
| | | | |
| | | | |

## Summary of Proposed Project Activities under RWSLIP

| No. | Description (Proposed Activity) | Quantity | Estimated Cost (INR thousand) | Drawing or Document Number |
|---|---|---|---|---|
| 1 | Rehabilitation of West Banas Dam | | | |
| 1.1 | Dam body and intake structure | 4 km | xxx | |
| (1) | Clearing of bush and trees | 4 km | xxx | xxx |
| (2) | Rehabilitation of dam embankment (widening of top of dam, 6 m) | 4 km | xxx | xxx |
| (3) | Repair of riprap | xxx km | xxx | xxx |
| (4) | Provision of quarry spalls on top of dam body | 4 km | xxx | xxx |
| (5) | Sod facing for downstream slope | xxx km | xxx | xxx |
| (6) | Repair of intake structure (wall and sluice gates) | 2 nos. | xxx | xxx |
| 1.2 | Spillway (rehabilitation of downstream walls at settling basin) | 1 nos. | xxx | xxx |
| 1.3 | Provision of filter toe | 3.4 km | xxx | xxx |
| | Sub-total 1 | | xxx | |
| 2 | Rehabilitation of Irrigation Canal System (Right Main Canal) | | | |
| 2.1 | Rehabilitation of existing canal lining | 5.45 km | xxx | xxx |
| 2.2 | Construction/rehabilitation of related structures | | | |
| (1) | Provision of measuring devices | xx nos. | xxx | xxx |
| (2) | Construction of washing steps | xx nos. | xxx | xxx |
| (3) | Rehabilitation of aqueduct | 15 nos. | xxx | xxx |
| (4) | Rehabilitation of siphon | 2 nos. | xxx | xxx |
| (5) | Rehabilitation of falls | 23 nos. | xxx | xxx |
| (6) | Rehabilitation of VRBs | 15 nos. | xxx | xxx |
| (7) | Replacement of outlets | xx nos. | xxx | xxx |
| | Sub-total 2 | | xxx | |
| 3 | Rehabilitation of Irrigation Canal System (Left Main Canal) | | | |
| 3.1 | Rehabilitation of existing canal lining | 4.32 km | xxx | xxx |
| 3.2 | Provision of new canal lining | 3.45 km | xxx | xxx |
| 3.3 | Construction/rehabilitation of related structures | | | |
| (1) | Provision of measuring devices | xx nos. | xxx | xxx |
| (2) | Construction of washing steps | xx nos. | xxx | xxx |
| (3) | Rehabilitation of aqueduct | 2 nos. | xxx | xxx |
| (4) | Rehabilitation of siphon | 8 nos. | xxx | xxx |
| (5) | Rehabilitation of falls | 5 nos. | xxx | xxx |
| (6) | Rehabilitation of VRBs | 2 nos. | xxx | xxx |
| (7) | Replacement of outlets | xx nos. | xxx | xxx |
| | Sub-total 3 | | | |
| 4 | Rehabilitation of Irrigation Canal System (Minor Canals) | 5 nos. | | |
| 4.1 | Rehabilitation of existing canal lining | 5.92 km | xxx | xxx |
| 4.2 | Construction/rehabilitation of related structures | | | |
| (1) | Provision of measuring devices | xx nos. | xxx | xxx |
| (2) | Construction of washing steps | xx nos. | xxx | xxx |
| (3) | Rehabilitation of siphon | 9 nos. | xxx | xxx |
| (4) | Rehabilitation of falls | 24 nos. | xxx | xxx |
| (5) | Rehabilitation of VRBs | 6 nos. | xxx | xxx |
| (6) | Replacement of outlets | xx nos. | xxx | xxx |
| | Sub-total 4 | | xxx | |
| 5 | Promotion of Micro Irrigation System (target area to be developed) | | | |
| 5.1 | Construction and installation of community based sprinkler system | 398 ha | 19.8 | xxx |
| 5.2 | Construction and installation of individual farmer based drip system | 40 ha | 3.3 | xxx |
| | Sub-total 5 | | 23.0 | xxx |
| 6 | Construction of WUA Constructive Facilities | | | |
| 6.1 | Construction of xxxxxxx at xxxxxxx | xx nos. | xxx | xxx |

| | | | | |
|---|---|---|---|---|
| | Sub-total 6 | | xxx | |
| 7 | Support for Gender Mainstreaming Activities | | | |
| 7.1 | Construction of xxxxxx at xxxxxx | xx nos. | xxx | xxx |
| 7.2 | Construction of xxxxxx at xxxxxx | xx nos. | xxx | xxx |
| 7.3 | Planting of xxxxxx at xxxxxx | xxx km | xxx | xxx |
| 7.4 | Planting of xxxxxx at xxxxxx | xxx km | xxx | xxx |
| | Sub-total 7 | | xxx | |
| **Total (1 - 7)** | | | **xxx** | |

# Procurement Plan, Implementation Schedule and Organizational Structure

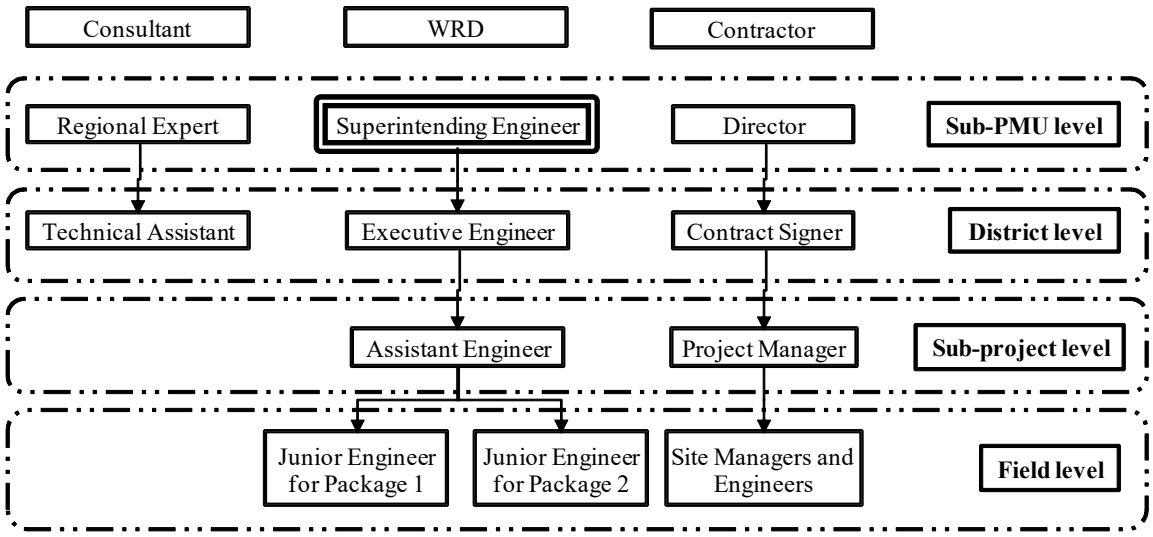
## Procurement Plan:

| No. | Name of Package | Procurement | Estimated Cost (INR mil.) |
|---|---|---|---|
| 1. | Package 1: Rehabilitation of West Banas Dam and Left Main Canal with Related Structures including Minor Canals | LCB | xxxxxxxxxxxx |
| 2. | Package 2: Rehabilitation of Right Mani Canal with Related Structures including Minor Canals | LCB | xxxxxxxxxxxx |

## Implementation Schedule for Construction Works

| Description | 2016 | | 2017 | | | | 2018 | | | | 2019 | | | | 2020 | | | | 2021 | | | | 2022 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 |
| 1 Pre-construction | | | | | | | | | | | | | | | | | | | | | | | | | | |
| (1) Detailed survey and review of DPR | | | | | | | | | | | | | | | | | | | | | | | | | | |
| (2) Procurement of SID consultant | | | | | | | | | | | | | | | | | | | | | | | | | | |
| (3) Walk-through survey and finalization of DPR by SID consultant | | | | | | | | | | | | | | | | | | | | | | | | | | |
| (4) Preparation of CAMPs by SID consultant | | | | | | | | | | | | | | | | | | | | | | | | | | |
| (5) Review of DPR by PMU | | | | | | | | | | | | | | | | | | | | | | | | | | |
| (6) MOU with WUA for committement and agreement | | | | | | | | | | | | | | | | | | | | | | | | | | |
| (7) Final screening and official approval of DPR | | | | | | | | | | | | | | | | | | | | | | | | | | |
| (8) Preparation and approval of technical estimate | | | | | | | | | | | | | | | | | | | | | | | | | | |
| (9) Preparation and approval of bidding document | | | | | | | | | | | | | | | | | | | | | | | | | | |
| (10) Bidding process | | | | | | | | | | | | | | | | | | | | | | | | | | |
| (11) Preparatory works for micro irrigation system | | | | | | | | | | | | | | | | | | | | | | | | | | |
| (12) Contract award and signing of the contract | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2 Construction Works | | | | | | | | | | | | | | | | | | | | | | | | | | |
| (1) Package-1 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Rehabilitation of West Banas Dam | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Clearing of bush and trees | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Rehabilitation of dam embankment | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Provision of filter toes | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Provision of quarry spalls | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Repair of parapet walls | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Rehabilitation of left main canal and related structures | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Rehabilitation of canal lining | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Rehabilitation of related structures | | | | | | | | | | | | | | | | | | | | | | | | | | |
| (2) Package-2 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Rehabilitation of right main canal and related structures | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Rehabilitation of canal lining | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Rehabilitation of related structures | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3 Defect Liability Period | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | |

## Organizational Structure for Construction Works



## Check List for RWSLIP (to be filled by PMU for review)

| S. No. | Check Item | Remarks | Refer to |
|---|---|---|---|
| 1. | All the required data for final screening such as EIRR, Dependability, Screening result of environmental and social consideration, MOU with WUA and CAMP are adequately studied and concluded in DPR? | | |
| 2. | Orientations for WUA facilities and women friendly activities were made and results are described in DPR? | | |
| 3. | Walk-through survey was conducted among WRD, DoA, DoH, WCD, WUA, WW, consultant and NGO and signed results are attached to DPR? | | |
| 4. | CAMP was prepared and summary of CAMP is attached to DPR? | | |
| 5. | Packaging of the contract for construction works was made reasonably and realistically? | | |
| 6. | Construction schedule was prepared reasonably and realistically considering pre-construction works (around one year) and maximum construction period (two years)? | | |
| 7. | Regular and special meeting for construction supervision and management was planned properly? | | |
| 8. | Screening for Environmental and Social Consideration before preparation of DPR was made and attached to DPR? | | |
| 9. | JICA category for environmental and social consideration? | A, B, C or NO | |
| 10. | In case of Categories A, B or C, adequate measures has been taken or described in DPR? | | |
| 11. | Authentication / Verification (Minutes of Sub-PMU Coordination Committee) signed by representatives of relevant agencies is attached to DPR? | | |
| 12. | All the data and information required in model DPR are clearly described in DPR? | | |

## Other Key Documents for the Proposed Activities

Att.1 Check list for environmental and social consideration (Screening for Environmental and Social Consideration before preparation of DPR)

Att.2 Summary of CAMP for soft components

**Att.1**
**Screening for Environmental and Social Consideration before preparation of DPR**

***Name of the Sub-project:***

***Location:***

***Name and signature of the Screening Officer:***

**Date of Screening:**

| S. No | Key areas of screening | Yes/ No | Recommended Action | If yes, JICA category |
|---|---|---|---|---|
| **1** | **Forests/ Tree Cover outside the forest** | | | |
| 1.1 | Will there be any repair and maintenance work of dam and/or canal in recorded forest areas of the state? | xxx | If yes, then WRD has to obtain necessary permission from the State Forest Department. | Category B |
| 1.2 | Will there be any tree felling from the recorded forest area? | xxx | If yes, then WRD has to obtain necessary permission from the State Forest Department before felling of trees. | Category B |
| 1.3 | Will there be any tree felling from the Revenue Land and/ or private land? | xxx | If yes, necessary permission to be obtained from Revenue as well as Forest Department before felling of trees. | Category C |
| **2** | **Protected Areas (National Parks, Wildlife Sanctuaries, Conservation Reserves and Community Reserves)** | | | |
| 2.1 | Is there a Protected Area within 10 km of the dam and/ or canal to be rehabilitated? | xxx | If yes, then WRD has to inform the State Forest Department about the activities to be carried out and take up the work as per the advice of the Forest Department. | Category C |
| 2.2 | Will there be any rehabilitation work in the Eco Sensitive Zones declared by the Forest Department (the Forest Department is in the process of declaring Eco Sensitive Zones for each Protected Area)? | xxx | If yes, then WRD has to inform the State Forest Department about the activities to be carried out and take up the work as per the advice of the Forest Department. Rain water harvesting is a permissible activity in Eco Sensitive Zones. In some sites there may huge construction work using machineries. It is better to consult the Forest Department before carrying out the rehabilitation work. | Category B |
| 2.3 | Does the work involve wildlife habitat areas (WL corridors, migratory birds, breeding ground etc.) outside the Protected Areas? | xxx | If yes, then the rehabilitation activities have to be carried out in consultation with the Forest Department of the State and adequate safeguards are to be incorporated into the DPR along with monitoring protocols. | Category B |
| **3** | **Catchment of the irrigation system/project** | | | |
| 3.1 | Is there any assessment of catchment area done? | xxx | If yes, what prescribed actions are to be included in the DPR.<br>If no, WRD may carry out a rapid assessment of the catchment area and prescribe actions for catchment treatment in the DPR (afforestation, soil and moisture conservation, proper drainage etc.).<br>If the catchment area includes recorded forest area then catchment treatment plan has to be planed and implemented through the Forest Department. | No category |
| **4** | **Green belt/ Tree cover/ Landscaping** | | | |
| 4.1 | Is there land available for plantations/ developing green belt? | xxx | If yes, required activities may be included in the DPR along with budget. | No category |
| 4.2 | Are the farmers/WUA members willing to take up tree plantation on their farmland/ farm bunds? | xxx | If yes, some activities for tree planting with farmers' participation may be included in the DPR along with budget. | No category |
| **5.** | **Dam** | | | |

| S. No | Key areas of screening | Yes/ No | Recommended Action | If yes, JICA category |
|---|---|---|---|---|
| 5.1 | Does the rehabilitation work involve a dam of 10 meters high or more? | xxx | If yes, Dam Safety Plan along with emergency response action to be prepared and included in DPR. | Category C |
| **6.** | **Use of Chemical Fertiliser and Pesticides** | | | |
| 6.1 | Is there any assessment made on the use of chemical fertilizers and pesticides? Will agriculture intensification lead to increased use of chemical fertilizers and pesticides? | xxx | If yes, kindly provide quantum of use of different chemical fertilizers and pesticides (crop and season wise).<br>Please include concrete action for a) mitigation measures, b) alternatives to the use of chemical fertilizers and pesticides. | Category C |
| **7** | **Water use conflicts** | | | |
| 7.1 | Are there any conflicts in the community/ target area on the water use? | xxx | If yes, the context has to be properly analysed and actions for addressing these conflicts need to be included in the DPR. | Category C |
| 7.2 | Will there be any significant problem in the water use and fisheries in the downstream areas? | xxx | If yes, then possible action to address the problem may be included in DPR. | Category B |
| 7.3 | Does the rehabilitation work cause risk of floods and damage to downstream resources? | xxx | If yes, then actions for flood management and drainage may be included in the DPR. | Category B |
| **8** | **Pollution** | | | |
| 8.1 | Will the rehabilitation work create water, air, noise pollution and soil/ land degradation? | xxx | If yes, then extent of pollution along with appropriate mitigation measures needs to be included in DPR. | If seriously, Category B.<br>If not serious, C |
| **9** | **Indigenous People/ Tribal, Women** | | | |
| 9.1 | Are there tribal communities living near the irrigation structure? | xxx | If yes, detailed information shall be provided in the DPR on their demography, habitation, distance from the dam and canal, landholding and benefits from irrigation structure/ system etc.. | No category |
| 9.2 | Does the rehabilitation work involve land acquisition, involuntary resettlement or construction on private land? | xxx | If yes, necessary environment clearance has to be obtained or the Sub Project will not be included the Project. | Category A |
| 9.3 | Does the rehabilitation of irrigation structure and canal involve eviction of people from the encroached land or release of land under encroachment? | xxx | If yes, then details of encroachment area and persons to be identified and necessary action permitted under the law, shall be included in the DPR. In case of tribal and other vulnerable communities, some mitigation measures shall be included in the Tribal Development Plan. | Category A |
| 9.4 | Will the rehabilitation of irrigation system and agriculture intensification works have any adverse impact on tribal communities? | xxx | If it has adverse impact, basically this sub-project should not be implemented. | Category A |
| 9.5 | Will the rehabilitation of irrigation system and agriculture intensification works have any adverse impact on women? | xxx | If yes, then women development plan shall be prepared and included in the DPR.<br>Efforts shall be made to proactively engage women in implementation of different project activities. | Category B |
| **10** | **Heritage/ Cultural/ Religious** | | | |
| 10.1 | Will the work under the Sub Project cause damage/ adverse impact to/on places of religious, historical and cultural importance? | xxx | If yes, then such action may be avoided in DPR and precautionary measures shall be included in the DPR. | Category B |

| **Final Evaluation** (Please put a circle at those categories) | Category A | Category B | Category C |
|---|---|---|---|

*Note: If the sub-project is located in environmental sensitive areas, then environmental management plan and environmental monitoring plan need to be prepared.*
*If rehabilitation of the sub-project will cause significant environment pollution (air, noise, dust, water, waste etc.), then environmental management plan and environmental monitoring plan need to be prepared.*
*If rehabilitation of the sub-project will negatively affect the tribal people, then tribal development plan needs to be prepared.*

**Att.2**

**Summary of Command Area Micro Plan (CAMP) for Soft Components**

***(Please attach summary of command area micro plan (CAMP) for Sub-PMU 3: Udaipur and Jodhpur Zones)***

# Detailed Project Report

## Rehabilitation of West Banas Irrigation Sub-project

## Table of Contents

## ABBRIVIATIONS

| | |
|---|---|
| ACE | Additional Chief Engineer |
| AE | Assistant Engineer |
| AD | Agriculture Department |
| ADP | Agriculture Development Project |
| CADD | Command Area Development Department |
| CCA | Cultivable Command Area |
| CE | Chief Engineer |
| DoA | Department of Agriculture |
| DOIT | Department of Information Technology |
| DPR | Detailed project Report |
| EE | Executive Engineer |
| EMP | Environment Management Plan |
| EIA | Environment Impact Assessment |
| EIRR | Economic Internal Rate of Return |
| GoR | Government of Rajasthan |
| HRD | Human Resource Development |
| IGNP | Indira Gandhi Nahar Project |
| IMTI | Irrigation Management Training Institute |
| IT | Information Technology |
| JE | Junior Engineer |
| JICA | Japan International Cooperation Agency |
| MIS | Management Information System |
| NGO | Non Government Agency |
| ODA | Official Development Assistance |
| OFD | On Farm Development |
| O&M | Operation & Management |
| PHED | Public Health Engineering Department |
| PMU | Project Management Unit |
| PIM | Participatory Irrigation Management |
| RAJAMIIP | Rajasthan Water Sector Livelihood Improvement Project |
| RFPMIS | The Rajasthan Farmers' Participation in Management of Irrigation Systems Act, 2000 |
| RWSLIP | Rajasthan Water sector Livelihood Improvement Project |
| SE | Superintending Engineer |
| SC | Schedule Caste |
| ST | Schedule Tribe |
| TC | Territorial Committee |
| TSG | Technical Support Group |
| WRD | Water Resources Department |
| WUA | Water Users Association |
| WUO | Water Users Organization |

## MEASUREMENT UNITS

| | |
|---|---|
| **Length** | |
| mm | Millimeter(s) |
| cm | Centimeter (s) |
| m | Meter (s) |
| m | Meter (s) |
| km | Kilometer (s) |
| **Area** | |
| $cm^2$ | Square Centimeter (s) |
| $m^2$ | Square Meter (s) |
| $km^2$ | Square Kilometers (1,000,000 $m^2$) |
| ha | Hectare (s) (10,000 $m^2$) |
| acre | Acre (s) (4,4046.8 $m^2$ or 0.40468 ha) |
| **Currency** | |
| US$ | US Dollar(s) |
| Yen | Japanese Yen |
| INR | Indian Rupee (`) |

| | |
|---|---|
| **Volume** | |
| $cm^3$ | Cubic centimeter (s) |
| $m^3$ | Cubic meter (s) |
| L | Liter(s)(1000$cm^3$) |
| MCM | Million Cubic Meter (s) |
| **Weight** | |
| g | Gram (s) |
| kg | Kilogram (s) (1000g) |
| ton | Metric tonne (s) (1,000Kg) |
| **Time** | |
| sec | Second (s) |
| min | Minutes (60 sec) |
| hr | Hours (60 min) |
| **Indian Numbering** | |
| Lac | Hundred Thousand |
| Crore | Ten Million (10,000,000) Or 100 Lac |

# *Section-1*

# SECTION-1 CHECK LIST

| S. No. | Check Item | Remarks | Refer to |
|---|---|---|---|
| 1. | Was the original project given investment clearance by planning commission? | The project was completed in the year 1963 and investment clearance was already given. | - |
| 2. | Have the salient features of the project as at present, been indicated? | Salient features of sub-project (existing and proposed) are attached at Section-2. | Section-2 |
| 3. | Have the irrigation potential of the existing project as originally envisaged, potential created and utilized and reasons for variations been indicated? | *(Please describe based on the result of command area survey)* | Chapter 1, 4 and 5 |
| 4. | 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? | *(Please describe based on the result of command area survey)* | Chapter 4 and 5 |
| 5. | Has the hydraulic survey of canal/distribution system been carried out? | *(Please finalize the report and drawings in Chapter 5 first)* | Chapter 5 |
| 6. | Have the deficiencies in the existing irrigation system been identified? | *(Please complete the walk-through survey, etc. and reports first)* | Chapter 1 and 5 |
| 7. | Has the need for rehabilitation been justified? | *(Please complete the walk-through survey, etc. and reports first)* | Chapter 1 |
| 8.<br>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: | Yes. | Chapter 2 |
| | (i) rainfall | | |
| | (ii) runoff | | |
| | (iii) flood | | |
| | (iv) sediment | | |
| | (v) ground water | | |
| | (vi) Evaporation | | |
| | Has justification for the proposed cropping pattern been furnished? | *(Please finalize the report and annex with DoA, first)* | Chapter 4 |
| 10. | Have the cropping pattern & proper cropping calendar been devised with a view to maximize the production and canal closures for maintenance etc. ensured? Have these been concurred by the Agriculture Department? | *(Please finalize the report and annex with DoA, first)* | Chapter 4 |
| 11. | 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? | *(Please finalize the report and annex with DoA, first)* | Chapter 4 |
| 12. | Have the net benefits due to the project been estimated and concurred by the Agricultural Department? | *(Please finalize the report and annex with DoA, first)* | Chapter 9 |
| 13. | Have the year wise requirement of funds been indicated? | *(Please finalize the report and annex, first)* | Chapter 9 |
| 14. | Are the detailed cost estimates included in the report? | *(Please finalize the report and annex, first)* | Volume 2 |
| 15. | Has the benefit-cost ratio been worked out? Whether depreciated cost of completed works has been included in the calculations? | *(Please finalize the report and annex, first)* | Chapter 9 |
| 16. | Whether internal Rate of Return (IRR) has been worked out? | *(Please finalize the report and annex, first)* | Chapter 9 |

# *Section-2*

# SECTION-2 SALIENT FEATURES

| S. No | Particulars | Unit | Planned/Existing | Proposed. |
|---|---|---|---|---|
| 1.0 | Name of the project | | Rehabilitation of West Banas Irrigation Sub-project | |
| 2.0 | General data | | | |
| 2.1 | District (s) | | Sirohi | |
| 2.2 | Tehsil (s) | | Pindwara/ Aburoad | |
| 2.3 | River / Tributary | | West Banas River | |
| 2.4 | Location of dam | | Near Dhanari village, Tehsil Pindwara | |
| 2.5 | Name of basin | | West Banas | |
| 2.6 | Longitude & Latitude (at dam site) | | 720 – 57' & 240 – 41' | |
| 3.0 | Socio- economic aspects | | | |
| 3.1 | District (s) benefited | | Sirohi | Sirohi |
| 3.2 | Population benefited | | | |
| | Total | nos | xxx | 51,320 |
| | Scheduled cast | nos | xxx | 6,790 |
| | Scheduled Tribe | nos | xxx | 20,670 |
| | Other backward castes | nos | xxx | 10,670 |
| 4.0 | Hydrological data | | | |
| 4.1 | Catchment area at dam site | | | |
| | Gross catchment area | $km^2$ | 507.64 | 507.64 |
| | Intercepted catchment area | $km^2$ | 93.24 | 93.24 |
| | Free catchment area | $km^2$ | 414.40 | 414.40 |
| 4.2 | Rainfall | | | |
| | Maximum annual rainfall | mm | xxx | 1,588.00 |
| | Minimum annual rainfall | mm | xxx | 205.00 |
| | Mean annual rainfall | mm | xxx | 604.00 |
| | 50% dependable annual rainfall | mm | xxx | 483.00 |
| 4.3 | Annual runoff | | | |
| | Average annual runoff | MCM | 43.00 | 27.66 |
| | Maximum annual runoff | MCM | xxx | 66.22 |
| | Minimum annual runoff | MCM | xxx | 4.10 |
| | 50% dependability annual runoff | MCM | xxx | 26.04 |
| 4.4 | Design flood | m3/s | 1,481.00 | 1,433.00 |
| 5.0 | Water utilization | | | |
| | Reservation for downstream use | MCM | - | - |
| | Utilization through the subproject | MCM | - | - |
| | Irrigation | MCM | 36.22 | 21.01 |
| | Drinking water & others | MCM | - | 1.41 |
| 6.0 | Reservoir data | | | |
| | a. Storage | | | |
| | i. Gross storage | MCM | 39.05 | 37.53 |
| | ii. Dead storage | MCM | 2.83 | 1.73 |
| | iii. Live Storage | MCM | 36.22 | 35.80 |
| | b. Elevation | | | |

| S. No | Particulars | Unit | Planned/Existing | Proposed. |
|---|---|---|---|---|
| | i. Top of dam (TBL) | el-m | 337.04 | 337.04 |
| | ii. Maximum water level (MWL) | el-m | 335.54 | 335.54 |
| | iii. Full reservoir level (FRL) | el-m | 334.45 | 334.45 |
| | v. Dead storage level (DSL) | el-m | 327.13 | 327.13 |
| | vi. River bed level (RBL) | el-m | 319.80 | 320.11 |
| | c. Water spread area at | | | |
| | i. Full reservoir level | $km^2$ | 8.40 | 7.25 |
| | ii Maximum water level | $km^2$ | 11.14 | 8.01 |
| 7.0 | Canal system (Irrigation) | | | |
| | No. of villages served. | nos | 36 | 36 |
| | Gross command area (GCA) | ha | 9,848 | 9,848 |
| | Culturable command area (CCA) | ha | 7,952 | 7,952 |
| | Annual Irrigation (AI) | ha | 2,704 | 6,203 |
| | Intensity of Irrigation (% age of CCA) | % | 34 | 78 |
| | Dependability | % | xxx | 50 |
| 7.1 | Left Main Canal | | | |
| | Length of canal | km | 22.32 | 22.32 |
| | Length of lined canal | km | 18.88 | 22.32 |
| | Full supply level at canal head | m | 327.73 | 327.73 |
| | Full supply discharge at canal head | $m^3/sec$ | xxx | xxx |
| 7.2 | Right Main Canal | | | |
| | Length of canal | km | 34.74 | 34.74 |
| | Length of lined canal | km | 34.63 | 34.63 |
| | Full supply level at canal head | m | 328.05 | 328.05 |
| | Full supply discharge at canal head | $m^3/sec$ | xxx | xxx |
| 7.3 | Distribution System | | | |
| | Length of canal | km | 17.76 | 17.76 |
| | Length of lined canal | km | 17.01 | 17.01 |
| 8.0 | Estimated cost of rehabilitation works | INR mil. | - | xxx |
| 9.0 | Benefit Cost Ratio | | - | xxx |
| 10.0 | Internal Rate of Return | % | - | xxx |

# *Section-3*

# Chapter 1 Introduction

## 1.1 General Description of West Banas Irrigation Sub-project

### 1.1.1 Rajasthan Water Sector Livelihood Improvement Project (RWSLIP)

For the purpose of the increase and stabilization of agricultural production in Rajasthan state, the government of Rajasthan implemented Rajasthan Minor Irrigation Improvement Project (RMIIP) from 2005 to 2015 under Japan International Cooperation Agency (JICA) ODA Loan. In addition to rehabilitation of the irrigation facilities, the project enhanced and organized water users associations (WUAs) that are the main actor of operation and maintenance of the facilities rehabilitated under the project. In addition, farming support activities were implemented in collaboration with Department of Agriculture (DoA) and contributed to improvement of agricultural production. In order to disseminate these achievements to the other area, the Rajasthan WRD made a program of which the final objective is reduction of poverty through technical support to agricultural practice, enhancement of value added agriculture, and improvement of livelihood in addition to rehabilitation of existing irrigation facilities.

The Rajasthan WRD compiled such program as Rajasthan Water Sector Livelihood Improvement Project (hereafter referred to as the Project or RWSLIP). The Project consists of the following five components:

i) Component 1: Participatory Irrigation Rehabilitation Works
ii) Component 2: Fostering and Capacity Enhancement of Water Users Organizations
iii) Component 3: Irrigated Agriculture Intensification and Diversification
iv) Component 4: Agro-processing, Marketing, and Promotion of High Value Agriculture Produces
v) Component 5: Gender Mainstreaming in Agriculture and Water Sector

In Component 1, the following sub-components are further included:

i) Sub-component 1-1: Rehabilitation of irrigation facilities
ii) Sub-component 1-2: Promotion of micro irrigation system
iii) Sub-component 1-3: Introduction of WUA constructive facilities
iv) Sub-component 1-4: Support for women friendly activities

Rehabilitation of West Banas Irrigation Sub-project (hereafter referred to as the Sub-project) is one of the candidate irrigation sub-projects under the above Component 1 of RWSLIP and this detailed project report (DPR) was prepared and submitted to Project Management Unit (PMU) for final screening and sanction for implementation.

### 1.1.2 West Banas Irrigation Sub-project

West Banas Irrigation Sub-project was completed in year 1963 to supply the irrigation water to area with 7,952 ha of CCA covering 36 villages, as a medium scale irrigation scheme. West Banas Irrigation Sub-project consists of the following facilities:

#### (1) West Banas Dam

West Banas dam was constructed across the West Banas river and located in tehsil Pindwara/Abu Road, District Sirohi. The dam was planned with the free catchment area of 414.40 $km^2$, live storage capacity of 39.05 $mm^3$. The dam comprises of 4,000 m long earthen embankment, 472 m long masonry / concrete spillway and 198 m long bye-wash (Bed-bar). Intake gates for left main canal and right main canal are located at RD 1230 m and RD 3410 m with sill levels as EL 327.13 m and EL 327.13 m, respectively.

#### (2) Canal System

Canal system consists of right main canal system and left main canal system and a part of canal system was rehabilitated under Rajasthan Water Sector Reform Project (RWSRP) funded by World Bank.

Total length of canal network is 74.82 km consisting of the following canal systems:

**Table A 1.1 General Features of Canal System**

| S. No. | Name of Canal | Category | Total length of Canal (m) | | | Discharge at canal head ($m^3$/sec) | CCA (ha) | No. of outlets |
|---|---|---|---|---|---|---|---|---|
| | | | Lined | Unlined | Total | | | |
| 1 | Right Main Canal | Main | 34,633 | 107 | 34,740 | 3.26 | 4,221 | 118 |
| 2 | Left Main Canal | Main | 18,875 | 3,445 | 22,320 | 0.64 | 1,300 | 67 |
| 3 | Fula Bai ka Khera Minor | Minor | 2,340 | - | 2,340 | 0.26 | 532 | 8 |
| 4 | Sangwara Minor | Minor | 3,750 | - | 3,750 | 0.21 | 428 | 16 |
| 5 | Achpura Minor | Minor | 3,117 | 753 | 3,870 | 0.31 | 636 | 8 |
| 6 | Mungthala Minor | Minor | 4,890 | - | 4,890 | 0.26 | 524 | 11 |
| 7 | Kyaria Minor | Minor | 2,910 | - | 2,910 | 0.15 | 312 | 8 |
| | | **Total** | **70,515** | **4,305** | **74,820** | | **7,952** | **236** |

## 1.2 Salient Features of the Sub-project

Salient features of the sub-project are shown in Section-2.

## 1.3 Walk-through Survey and Preliminary Assessment

Walk through survey to confirm and identify the present performance of various components, irrigation potential and deficiencies was conducted. Considering the sub-component activities described in the above 1.1.1, the following government officers and farmers were invited for the walk-through survey:

- WRD Assistant Engineer and Junior Engineers in charge,
- DoA and DoH Assistant Directors in charge,
- WCD Assistant Director in charge,
- WUA members in the Sub-project, and
- Women Wing members in the Sub-project.

The result of walk-through survey is shown in Annex 1.1 and summary of walk-through survey result including additional preliminary assessment with available data and information is shown below.

### 1.3.1 Present Performance of Various Components

#### (1) West Banas Dam

West Banas Irrigation sub-project was commissioned in the year 1962-63 and the performance initially was satisfied. However, due to deferred maintenance, damages and defects were found in the various facilities such as slope of dam, width of top of dam body, filter toe, seepage, head outlet sluice and gates and spillway.

#### (2) Canal System

Due to poor maintenance works, the canals and related structures were damaged and downstream farmers are suffering from water shortage.

### 1.3.2 Irrigation Potential

Record of actual irrigated area under West Banas Irrigation Sub-project is shown below.

**Table A 1.2 Record of Actual Irrigated Area**

| S. No | Year | Actual live storage at the end of monsoon season ($mm^3$) | Actual irrigated area (ha) |
|---|---|---|---|
| 1 | 1962-63 | 19.124 | 92 |
| 2 | 1963-64 | 25.225 | 891 |
| 3 | 1964-65 | 34.824 | 2,038 |
| 4 | 1965-66 | 24.993 | 2,443 |
| 5 | 1966-67 | 32.892 | 2,493 |
| 6 | 1967-68 | 38.493 | 4,058 |

| S. No | Year | Actual live storage at the end of monsoon season ($mm^3$) | Actual irrigated area (ha) |
|---|---|---|---|
| 7 | 1968-69 | 39.054 | 3,326 |
| 8 | 1969-70 | 9.386 | - |
| 9 | 1970-71 | 39.054 | 3,666 |
| 10 | 1971-72 | 19.299 | 1,561 |
| 11 | 1972-73 | 15.285 | 698 |
| 12 | 1973-74 | 14.587 | 1,947 |
| 13 | 1974-75 | 11.200 | 1,354 |
| 15 | 1975-76 | 39.054 | 3,349 |
| 16 | 1976-77 | 39.054 | 3,415 |
| 17 | 1977-78 | 39.054 | 3,932 |
| 18 | 1978-79 | 39.054 | 3,916 |
| 19 | 1979-80 | 29.857 | 3,162 |
| 20 | 1980-81 | 25.69 | 2,033 |
| 21 | 1981-82 | 5.569 | 101 |
| 22 | 1982-83 | 18.775 | 1,668 |
| 23 | 1983-84 | 39.054 | 4,215 |
| 24 | 1984-85 | 25.225 | 2,270 |
| 25 | 1985-86 | 17.903 | 3,117 |
| 26 | 1986-87 | 22.438 | 900 |
| 27 | 1987-88 | 6.894 | - |
| 28 | 1988-89 | 28.245 | 2,838 |
| 29 | 1989-90 | 26.037 | 2,067 |
| 30 | 1990-91 | 39.054 | 4,332 |
| 31 | 1991-92 | 17.029 | 1,512 |
| 32 | 1992-93 | 39.054 | 4,457 |
| 33 | 1993-94 | 39.054 | 4,000 |
| 34 | 1994-95 | 39.054 | 2,718 |
| 35 | 1995-96 | 20.607 | 1,755 |
| 36 | 1996-97 | 13.714 | 300 |
| 37 | 1997-98 | 39.054 | 4,031 |
| 38 | 1998-99 | 15.023 | 2,161 |
| 39 | 1999-2000 | 8.296 | - |
| 40 | 2000-2001 | 18.166 | - |
| 41 | 2001-02 | 21.392 | 2,672 |
| 42 | 2002-03 | 9.749 | - |
| 43 | 2003-04 | 27.084 | 1,339 |
| 44 | 2004-05 | 10.596 | - |
| 45 | 2005-06 | 39.054 | 3,520 |
| 46 | 2006-07 | 39.054 | 3,322 |
| 47 | 2007-08 | 33.008 | 2,985 |
| 48 | 2008-09 | 7.571 | - |
| 49 | 2009 -10 | 14.413 | Reserved for drinking |
| 50 | 2010-11 | 34.237 | 4,081 |
| 51 | 2011-12 | 39.054 | 3,170 |
| 52 | 2012-13 | 39.054 | 2,827 |
| 53 | 2013-14 | 4.458 | - |
| 54 | 2014-15 | 4.101 | - |
| 55 | 2015-16 | 39.054 | 2,810 |

As shown in the above table, maximum irrigated area of 4,475 ha was recorded in 1992-93. Irrigated area gradually decreased and was 2,810 ha in 2015-16 despite the full water level in the reservoir.

### 1.3.3 Deficiencies in Existing Canal System

#### (1) Dam and Canal System

In addition to the above 1.3.1, the maximum irrigation intensity record during past 60 years was just only 56% and this figure shows that the canal system is not optimum and should be re-designed based on latest command area survey.

#### (2) WUA Activity

Although the WUA office building was constructed under RWSRP, such office has not been effectively utilized so far.

#### (3) Gender Mainstreaming

Canal maintenance and cleaning works were made mainly by women and caused a large workload on them. In addition, it was also found that some of the facilities deeply related to women's activities such as washing steps and foot bridges were constructed without any involvement of women living in the area in the past construction.

#### (4) Agronomical

Major problems in the Sub-project area are i) lack of coordination among government field officers and farmers to formulate the optimum project plan especially for cropping pattern, and ii) lack of motivation of DoA and DoH field officers to provide periodical training and information related to advanced or new agriculture techniques or information.

#### (5) Administrative

Major problems in the Sub-project area are i) lack of coordination among government field officers, ii) lack of motivation of government field officers to provide periodical training and information to farmers, iii) lack of number of government field officers and iv) lack of coordination between government officers and farmers.

#### (6) Legislative

Amount and collection rate of water fee is not sufficient to recover the required cost for proper operation and maintenance works for the Sub-project.

## 1.4 Justification/Need for Rehabilitation and Improvement

Based on the walk-through survey and preliminary assessment made in the above 1.3, the following rehabilitation and improvement works are urgently required to recover, improve and maximize the Sub-project function and benefits:

### 1.4.1 West Banas Dam and Canal System

As shown in 1.3.2, the latest irrigation intensity decreased up to 63% of the maximum intensity recorded in 1992-93. According to the preliminary assessment including walk-through survey, the following rehabilitation works should be made to recover and maximize the irrigation intensity and the structural strength of the facilities:

i) Rehabilitation of dam body including jungle clearing, embankment, riprap, sod facing, filter toe and provision of quarry spalls,
ii) Rehabilitation of settling basin at spillway of dam,
iii) Rehabilitation of intake structure including sluice gates,
iv) Rehabilitation of existing canal lining and construction of new canal lining,
v) Rehabilitation of existing canal related structures,
vi) Construction of measuring devices, and
vii) Re-design of canal system and rehabilitation of outlets based on command area survey.

### 1.4.2 WUA Activities and Facilities

Since WUA office building has been already constructed under RWSRP, no WUA office building will be provided to WUAs of this Sub-project. Other activities for WUA are described in CAMP for soft component.

### 1.4.3 Gender Mainstreaming -Women Friendly Facilities and Trees-

For gender mainstreaming in canal system, through orientation and walk-through survey, the following facilities were selected by women wing members as women friendly facilities:

| Type of Facility | Number | Location |
|---|---|---|
| xxxxxxxxxx | xxx | xxxxxxxxxx |
| xxxxxxxxxx | xxx | xxxxxxxxxx |

In addition to the above facilities, through orientation and walk-through survey, the following trees were selected by women wing members as women friendly trees:

| Type of Tree | Length (m) | Location |
|---|---|---|
| xxxxxxxxxx | xxx | xxxxxxxxxx |
| xxxxxxxxxx | xxx | xxxxxxxxxx |

### 1.4.4 Agronomical -Cropping Pattern and Calendar-

Based on CAMP for soft component, proper cropping pattern and calendar should be prepared in full cooperation with DoA.

### 1.4.5 Operation and Maintenance -Collection of Water Tariff-

For proper operation and maintenance works, collection rate as well as amount of water tariff should be increased. Detailed program for capacity building of WUA is shown in CAMP for soft component.

### 1.4.6 Others -Soft Component Activities-

In case the Sub-project is selected for implementation under RWSLIP, the soft component activities under the following components can be expected and through those activities, it is expected to increase the farmers' income and improve the capacity of WUA in terms of operation and maintenance including water management:

i) Component 2: Fostering and Capacity Enhancement of Water Users Organizations
ii) Component 3: Irrigated Agriculture Intensification and Diversification
iii) Component 4: Agro-processing, Marketing, and Promotion of High Value Agriculture Produces
iv) Component 5: Gender Mainstreaming in Agriculture and Water Sector

Detailed activities under the above Components are shown in Command Area Micro Plan (CAMP) for soft components and summary of CAMP is attached to Executive Summary of this report. All the concerned parties including WRD officers, line agencies officers, WUA members, NGOs and consultants should well understand the contents of CAMP and collaborate each other to maximize the expected benefit and income from the Sub-project.

## 1.5 Summary of Proposed Rehabilitation Works for the Sub-project

Based on the above 1.4, the following rehabilitation works are proposed for West Banas Irrigation System and detailed study and design for optimum design as well as further justification are described in the following chapters:

| No. | Description (Proposed Activity) | Quantity | Estimated Cost (INR thousand) | Drawing or Document Number |
|---|---|---|---|---|
| 1 | Rehabilitation of West Banas Dam | | | |
| 1.1 | Dam body and intake structure | 4 km | 53.8 | |
| (1) | Clearing of bush and trees | 4 km | xxx | xxx |
| (2) | Rehabilitation of dam embankment (widening of top of dam, 6 m) | 4 km | xxx | xxx |
| (3) | Repair of riprap | xxx km | xxx | xxx |
| (4) | Provision of quarry spalls on top of dam body | 4 km | xxx | xxx |
| (5) | Sod facing for downstream slope | xxx km | xxx | xxx |
| (6) | Repair of intake structure (wall and sluice gates) | 2 nos. | xxx | xxx |
| 1.2 | Spillway (rehabilitation of downstream walls at settling basin) | 1 nos. | 7.2 | xxx |
| 1.3 | Provision of filter toe | 3.4 km | 15.9 | xxx |
| | Sub-total 1 | | 76.9 | |
| 2 | Rehabilitation of Irrigation Canal System (Right Main Canal) | | | |
| 2.1 | Rehabilitation of existing canal lining | 5.45 km | xxx | |
| 2.2 | Construction/rehabilitation of related structures | | | |
| (1) | Provision of measuring devices | xx nos. | xxx | |
| (2) | Construction of washing steps | xx nos. | xxx | |
| (3) | Rehabilitation of aqueduct | 15 nos. | xxx | |
| (4) | Rehabilitation of siphon | 2 nos. | xxx | |
| (5) | Rehabilitation of falls | 23 nos. | xxx | |
| (6) | Rehabilitation of VRBs | 15 nos. | xxx | |
| (7) | Replacement of outlets | xx nos. | xxx | |
| | Sub-total 2 | | xxx | |
| 3 | Rehabilitation of Irrigation Canal System (Left Main Canal) | | | |
| 3.1 | Rehabilitation of existing canal lining | 4.32 km | xxx | |
| 3.2 | Provision of new canal lining | 3.45 km | xxx | |
| 3.3 | Construction/rehabilitation of related structures | | | |
| (1) | Provision of measuring devices | xx nos. | xxx | |
| (2) | Construction of washing steps | xx nos. | xxx | |
| (3) | Rehabilitation of aqueduct | 2 nos. | xxx | |
| (4) | Rehabilitation of siphon | 8 nos. | xxx | |
| (5) | Rehabilitation of falls | 5 nos. | xxx | |
| (6) | Rehabilitation of VRBs | 2 nos. | xxx | |
| (7) | Replacement of outlets | xx nos. | xxx | |
| | Sub-total 3 | | | |
| 4 | Rehabilitation of Irrigation Canal System (Minor Canals) | 5 nos. | | |
| 4.1 | Rehabilitation of existing canal lining | 5.92 km | xxx | |
| 4.2 | Construction/rehabilitation of related structures | | | |
| (1) | Provision of measuring devices | xx nos. | xxx | |
| (2) | Construction of washing steps | xx nos. | xxx | |
| (3) | Rehabilitation of siphon | 9 nos. | xxx | |
| (4) | Rehabilitation of falls | 24 nos. | xxx | |
| (5) | Rehabilitation of VRBs | 6 nos. | xxx | |
| (6) | Replacement of outlets | xx nos. | xxx | |
| | Sub-total 4 | | xxx | |
| 5 | Promotion of Micro Irrigation System (target area to be developed) | | | |
| 5.1 | Construction and installation of community based sprinkler system | 398 ha | 19.8 | |
| 5.2 | Construction and installation of individual farmer based drip system | 40 ha | 3.3 | |
| | Sub-total 4 | | 23.0 | |
| 6 | Construction of WUA Constructive Facilities | | | |
| 6.1 | Construction of xxxxxxx at xxxxxxx | xx nos. | xxx | |
| | Sub-total 5 | | xxx | |

| | | | | |
|---|---|---|---|---|
| 7 | Support for Gender Mainstreaming Activities | | | |
| 7.1 | Construction of xxxxxx at xxxxxx | xx nos. | xxx | |
| 7.2 | Construction of xxxxxx at xxxxxx | xx nos. | xxx | |
| 7.3 | Planting of xxxxxx at xxxxxx | xxx km | xxx | |
| 7.4 | Planting of xxxxxx at xxxxxx | xxx km | xxx | |
| | Sub-total 7 | | xxx | |
| **Total (1 - 7)** | | | **xxx** | |

# Chapter 2 Hydrology

## 2.1 Rainfall

Based on the rainfall data for last 40 years from Sirohi and Pindwara stations, average rainfall at the Sub-project area was calculated as shown in the following table:

**Table 2.1 Observed rainfall data for 40 years**

| S. No. | Year | Rainfall at station(in mm) | |
|---|---|---|---|
| | | Sirohi | Pindwara |
| 1 | 1975 | 977.00 | 779.00 |
| 2 | 1976 | 1,126.00 | 650.00 |
| 3 | 1977 | 807.00 | 812.00 |
| 4 | 1978 | 724.00 | 670.00 |
| 5 | 1979 | 604.00 | 628.00 |
| 6 | 1980 | 436.00 | 561.00 |
| 7 | 1981 | 350.00 | 361.00 |
| 8 | 1982 | 366.00 | 619.00 |
| 9 | 1983 | 781.00 | 809.00 |
| 10 | 1984 | 425.00 | 582.00 |
| 11 | 1985 | 283.00 | 506.00 |
| 12 | 1986 | 294.00 | 483.00 |
| 13 | 1987 | 191.00 | 219.00 |
| 14 | 1988 | 333.00 | 545.00 |
| 15 | 1989 | 455.00 | 653.00 |
| 16 | 1990 | 1,415.00 | 1,351.00 |
| 17 | 1991 | 207.00 | 517.00 |
| 18 | 1992 | 932.00 | 1249.00 |
| 19 | 1993 | 542.00 | 613.00 |
| 20 | 1994 | 719.00 | 1,194.00 |
| 21 | 1995 | 523.00 | 545.00 |
| 22 | 1996 | 469.00 | 710.00 |
| 23 | 1997 | 835.00 | 962.00 |
| 24 | 1998 | 504.00 | 600.00 |
| 25 | 1999 | 342.00 | 338.00 |
| 26 | 2000 | 363.00 | 516.00 |
| 27 | 2001 | 571.00 | 531.00 |
| 28 | 2002 | 196.00 | 298.00 |
| 29 | 2003 | 760.00 | 745.00 |
| 30 | 2004 | 386.00 | 523.00 |
| 31 | 2005 | 818.00 | 1,161.00 |
| 32 | 2006 | 1,234.00 | 1,842.00 |
| 33 | 2007 | 636.00 | 1,012.00 |

| S. No. | Year | Rainfall at station(in mm) | |
|---|---|---|---|
| | | Sirohi | Pindwara |
| 34 | 2008 | 298.00 | 317.00 |
| 35 | 2009 | 396.00 | 521.00 |
| 36 | 2010 | 801.00 | 930.00 |
| 37 | 2011 | 751.00 | 1,336.00 |
| 38 | 2012 | 783.00 | 681.00 |
| 39 | 2013 | 439.00 | 561.00 |
| 40 | 2014 | 446.00 | 492.00 |
| Average | | 587.95 | 710.55 |
| **Average** | | **649.25** | |

## 2.2 Runoff

Record of gauge reading and runoff for last 51 years observed at West Banas Dam is shown in the following table with dependability:

**Table 2.2 Details of observed runoff and dependability**

(Yield Calculation with inflow Data)

Gross catchment area: 507.64 $km^2$

Gross storage: 39.05 $m^3$

| S. No. | Year | Gauge reading (m) | Yield ($Mm^3$) | Spilled over ($Mm^3$) | Total yield ($Mm^3$) | Yield in descending order ($Mm^3$) | Dependability % |
|---|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| 1 | 1965 | 5.61 | 24.99 | 0.00 | 24.99 | 66.22 | 1.9 |
| 2 | 1966 | 6.65 | 32.89 | 0.00 | 32.89 | 60.19 | 3.8 |
| 3 | 1967 | 7.24 | 39.05 | 0.00 | 39.05 | 48.62 | 5.8 |
| 4 | 1968 | 8.25 | 39.05 | 0.00 | 39.05 | 48.62 | 7.7 |
| 5 | 1969 | 6.71 | 33.36 | 0.00 | 33.36 | 46.15 | 9.6 |
| 6 | 1970 | 7.53 | 39.05 | 2.11 | 41.16 | 43.83 | 11.5 |
| 7 | 1971 | 4.75 | 19.30 | 0.00 | 19.30 | 42.24 | 13.5 |
| 8 | 1972 | 4.05 | 15.29 | 0.00 | 15.29 | 41.16 | 15.4 |
| 9 | 1973 | 3.93 | 14.58 | 0.00 | 14.58 | 40.74 | 17.3 |
| 10 | 1974 | 3.20 | 11.20 | 0.00 | 11.20 | 39.89 | 19.2 |
| 11 | 1975 | 7.67 | 39.05 | 7.10 | 46.15 | 39.82 | 21.2 |
| 12 | 1976 | 7.42 | 39.05 | 0.45 | 39.50 | 39.78 | 23.1 |
| 13 | 1977 | 7.47 | 39.05 | 0.51 | 39.56 | 39.56 | 25.0 |
| 14 | 1978 | 7.39 | 39.05 | 0.27 | 39.32 | 39.50 | 26.9 |
| 15 | 1979 | 6.25 | 29.87 | 0.00 | 29.87 | 39.32 | 28.8 |
| 16 | 1980 | 5.70 | 25.69 | 0.00 | 25.69 | 39.21 | 30.8 |
| 17 | 1981 | 1.54 | 5.57 | 0.00 | 5.57 | 39.05 | 32.7 |
| 18 | 1982 | 4.66 | 18.77 | 0.00 | 18.77 | 39.05 | 34.6 |
| 19 | 1983 | 7.53 | 39.05 | 1.69 | 40.74 | 34.24 | 36.5 |
| 20 | 1984 | 5.64 | 25.23 | 0.00 | 25.23 | 33.36 | 38.5 |
| 21 | 1985 | 4.51 | 17.90 | 0.00 | 17.90 | 33.01 | 40.4 |
| 22 | 1986 | 5.27 | 22.44 | 0.00 | 22.44 | 32.89 | 42.3 |
| 23 | 1987 | 2.10 | 6.89 | 0.00 | 6.89 | 29.87 | 44.2 |
| 24 | 1988 | 6.04 | 28.25 | 0.00 | 28.25 | 28.25 | 46.2 |

| S. No. | Year | Gauge reading (m) | Yield ($Mm^3$) | Spilled over ($Mm^3$) | Total yield ($Mm^3$) | Yield in descending order ($Mm^3$) | Dependability % |
|---|---|---|---|---|---|---|---|
| 25 | 1989 | 5.75 | 26.04 | 0.00 | 26.04 | 27.08 | 48.1 |
| 26 | 1990 | 8.53 | 39.05 | 27.17 | 66.22 | 26.04 | 50.0 |
| 27 | 1991 | 4.36 | 17.03 | 0.00 | 17.03 | 25.69 | 51.9 |
| 28 | 1992 | 7.83 | 39.05 | 4.78 | 43.83 | 25.23 | 53.8 |
| 29 | 1993 | 7.44 | 39.05 | 0.73 | 39.78 | 24.99 | 55.8 |
| 30 | 1994 | 7.83 | 39.05 | 9.57 | 48.62 | 22.44 | 57.7 |
| 31 | 1995 | 4.98 | 20.61 | 0.00 | 20.61 | 21.39 | 59.6 |
| 32 | 1996 | 3.78 | 13.71 | 0.00 | 13.71 | 20.61 | 61.5 |
| 33 | 1997 | 7.38 | 39.05 | 0.77 | 39.82 | 19.30 | 63.5 |
| 34 | 1998 | 4.01 | 15.02 | 0.00 | 15.02 | 18.77 | 65.4 |
| 35 | 1999 | 2.47 | 8.30 | 0.00 | 8.30 | 18.17 | 67.3 |
| 36 | 2000 | 4.56 | 18.17 | 0.00 | 18.17 | 17.90 | 69.2 |
| 37 | 2001 | 5.12 | 21.39 | 0.00 | 21.39 | 17.03 | 71.2 |
| 38 | 2002 | 2.83 | 9.75 | 0.00 | 9.75 | 15.29 | 73.1 |
| 39 | 2003 | 5.88 | 27.08 | 0.00 | 27.08 | 15.02 | 75.0 |
| 40 | 2004 | 3.05 | 10.60 | 0.00 | 10.60 | 14.58 | 76.9 |
| 41 | 2005 | 8.14 | 39.05 | 9.57 | 48.62 | 14.41 | 78.8 |
| 42 | 2006 | 9.14 | 39.05 | 21.14 | 60.19 | 13.71 | 80.8 |
| 43 | 2007 | 6.66 | 33.01 | 0.00 | 33.01 | 11.20 | 82.7 |
| 44 | 2008 | 2.29 | 7.57 | 0.00 | 7.57 | 10.60 | 84.6 |
| 45 | 2009 | 3.9 | 14.41 | 0.00 | 14.41 | 9.75 | 86.5 |
| 46 | 2010 | 6.8 | 34.24 | 0.00 | 34.24 | 8.30 | 88.5 |
| 47 | 2011 | 7.83 | 39.05 | 3.19 | 42.24 | 7.57 | 90.4 |
| 48 | 2012 | 7.33 | 39.05 | 0.16 | 39.21 | 6.89 | 92.3 |
| 49 | 2013 | 1.07 | 4.46 | 0.00 | 4.46 | 5.57 | 94.2 |
| 50 | 2014 | 0.91 | 4.10 | 0.00 | 4.10 | 4.46 | 96.2 |
| 51 | 2015 | 7.53 | 39.05 | 0.84 | 39.89 | 4.10 | 98.1 |

**50% dependability = 26.04 $Mm^3$**

**75% dependability = 15.02 $Mm^3$**

## 2.3 Flood Discharge

Peak flood discharge was calculated based on the guidelines for "flood estimation report for Chambal sub-basin 1 (b)" issued by Central Water Commission. Peak flood discharge, thus calculated, is 1,432.34 $m^3/s$ and details are shown in Annex 2.1.

## 2.4 Sedimentation

No record of sedimentation is available for West Banas Dam. Base on the survey data of reservoir capacity, it was found that the dead and live capacity have decreased as follows:

| Description | Original | Present Condition |
|---|---|---|
| Dead Storage | 2.83 | 1.73 |
| Live Storage | 36.22 | 35.80 |

As shown in the above table, live storage capacity has decreased only 0.42 $m^3$ during 51 years and it can be judged that the sedimentation volume may be negligible in West Banas Dam.

## 2.5 Evaporation

Mean or average evaporation rates at West Banas Dam site are summarized in the following table:

**Table 2.3 Mean/Average Evaporation Rates at West Banas Dam**

| Month | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| mm/day | 2.1 | 2.8 | 5.6 | 8.0 | 11.0 | 8.2 | 4.6 | 3.7 | 3.2 | 4.0 | 2.8 | 2.1 |
| mm | 63.8 | 76.9 | 173.8 | 240.2 | 340.5 | 247.1 | 141.9 | 113.5 | 96.1 | 142.1 | 82.4 | 63.8 |

Base on the above table, total evaporation rate and losses from the middle of June, i.e. beginning of monsoon, to the middle of March, i.e. end of irrigation period, can be estimated as 991.0 mm and 3.59 $Mm^3$, respectively.

# Chapter 3 Rehabilitation of West Banas Dam

## 3.1 Design Criteria and Standards used for Survey and Design Works

xxxxxxxxxxxxxx.

*(Please describe the design criteria and standards used for survey and design works)*

## 3.2 General Features and Present Conditions of Existing West Banas Dam

General features and present conditions of existing West Banas Dam are summarized as follows:

**Table 3.1 General Features and Present Conditions of Existing West Banas Dam**

| S. No | Reservoir Parameters | Unit | Existing | Proposed |
|---|---|---|---|---|
| 1 | Reservoir data | | | |
| a. | Elevation | | | |
| i. | Top level of dam (TBL) | El-m | 337.04 | 337.04 |
| ii. | Maximum water level (MWL) | El-m | 335.54 | 335.54 |
| iii. | Full reservoir level (FRL) | El-m | 334.45 | 334.45 |
| iv. | Dead storage level (DSL) | El-m | 327.13 | 327.13 |
| v. | River bed level (RBL) | El-m | 319.80 | 320.11 |
| vi. | Irrigation outlet level (IOL) | El-m | 327.13 | 327.13 |
| 2 | Main dam | | | |
| a. | Length | | | |
| i. | Earthen dam | m | 4000 | 4000 |
| ii. | Spillway (ogee shaped weir) | m | 472 | 472 |
| iii. | Bye-wash | m | 198 | 198 |
| b. | Top width of earthen | m | 3 | 6 |
| c. | U/S slope | | 1:3 | 1:3 |
| d. | D/S slope | | 1:2 | 1:2.5 |
| e. | Number & size of gates at Head Outlet Sluice | | 2 nos (RD 1230 and 3410) 1.5*1.5 m & 0.9*0.9 m | 2 nos (RD 1230 and 3410) 1.5*1.5 m & 0.9*0.9 m |
| g. | Filter toe from/to | m | 405 to 540 & 2580 to 2760 | 600 to4000 |
| h. | Pitching on U/S slope From/to | m | 0 to 4000 | 0 to 4000 |

## 3.3 Detailed Survey Works on Existing West Banas Dam

xxxxxxxxxxxxxxxxxx.

*(Please describe the details of survey works at dam site such as the followings including locations of bench marks, interval of sections, etc.)*

### 3.3.1 Submergence Area Survey

Result of submergence area survey is shown in the Drawing no..... and capacity-area curve is prepared as shown in the Drawing no..... According to the result of submergence survey, present dead and live storage capacity was estimated as 1.73 $Mm^3$ and 35.80 $Mm^3$, respectively.

### 3.3.2 Long and Cross Section Survey for Dam Body

Long and cross section survey for dam body was made at every 100 m and result is shown in the Drawing no.....

### 3.3.3 Inventory Survey for Dam Facilities

(*Please describe the details and results of inventory survey for dam facilities including Drawings*)

## 3.4 Rehabilitation of Dam Body

### 3.4.1 Detailed Deficiencies in Dam Body

As shown in the result of long and cross section survey and inventory survey described in the above 3.3, the following deficiencies were found in dam body:

i) Upstream and downstream slopes are totally covered by bushes and trees,
ii) Top width and downstream slope of dam embankment are not conformed to the latest BIS code and erosions and damages were observed,
iii) Riprap protection is damaged and not well functions,
iv) Filter toe is chocked and not functions, and
v) Top of dam used as maintenance road is damaged

### 3.4.2 Proposed Rehabilitation Works for Dam Body

Mainly to secure the safety of dam, the following rehabilitation works are proposed for dam body and details are shown in the Drawings no..... to .....

i) Clearing of bushes and trees at upstream and downstream of dam body (RD 0 – 4000),
ii) Rehabilitation of dam body including widening of top width from 3.0 m to 6.0 m and change of slope gradient of downstream slope from 1:2 to 1:2.5 with drainage trench at every 60 m long for vertical and at every berm for horizontal (RD 0 – 4000),
iii) Repair of riprap protection at upstream slope (RD 0 – 4000),
iv) Repair of existing filter toe and provision of additional filter toe at downstream slope (RD 600 – 4000), and
v) Provision of quarry spalls on top of dam used as inspection road (RD 0 – 4000).

The stability calculation after rehabilitation works was made and results are shown in Annex 3.1.

## 3.5 Rehabilitation of Head Outlet Sluice (Intake Structure)

### 3.5.1 Detailed Deficiencies in Head Outlet Sluice

According to the inventory survey shown in 3.3.3, the following deficiencies were found in head outlet sluice (intake structure) and details are shown in the Drawings no..... to .....:

i) Sluice gates both for left main canal and right main canal are deteriorated in terms of damage of sealing, spindle, etc. and cause considerable volume of seepage and water loss.

### 3.5.2 Proposed Rehabilitation Works for Head Outlet Sluice

In order to prevent seepage and water loss through damaged sluice gates, the following rehabilitation works are proposed for head outlet sluice (intake structure):

i) Replacement of sluice gates both for left main canal and right main canal including gate leaf, guide frame, hoisting equipments, sealing compound, etc.

## 3.6 Rehabilitation of Spillway Structure

### 3.6.1 Detailed Deficiencies in Spillway Structure

According to the inventory survey shown in 3.3.3, spillway structure generally functions well and only the following minor deficiencies were observed at spillway structure:

i) Damages of toe walls at settling basin.

### 3.6.2 Proposed Rehabilitation Works for Spillway Structure

For safety of spillway structure, he following rehabilitation works are proposed for spillway structure and details are shown in the Drawings no..... to .....:

i) Remedial works for toe walls at settling basin including protection with gabion mattress.

# Chapter 4 Cropping Pattern and Irrigation Water Requirement

## 4.1 Present Cropping Pattern and Crop Calendar

Present cropping pattern is shown in the following table:

**Table 4.1 Present Cropping Pattern**

| Crop with variety | Growing period | | Percentage of CCA | ha |
|---|---|---|---|---|
| | Optimum sowing Date | Optimum maturity Date | | |
| Rabi | | | | |
| i) Wheat | 1st Nov | 20th March | 12 | 954 |
| ii) Musturd | 15th Oct | 30th January | 10 | 795 |
| iii) Barley | 1st Nov | 20th March | 5 | 398 |
| iv) Garm | 10th Nov | 20th January | 5 | 398 |
| v) Cumin | 15th Nov | 20th March | 2 | 159 |
| **Total** | | | **34** | **2,703** |

## 4.2 Studies on Optimum Cropping Pattern

### 4.2.1 Collected and Available Data

xxxxxxxxxxxxxxxxxxx.

(*Please describe the collected and available data such as original soil survey data, land use map, climatic data, etc.*)

### 4.2.2 Additional Survey and Study during Preparation of DPR

xxxxxxxxxxxxxxxxxxx.

(*Please describe additional survey and study results such as soil survey data, land use map, available technical support and information such as new seeds and varieties, fertilizers, pesticides, latest data of crop wise water requirement, updated field application efficiency, parasites, farmer's intension to introduction of new crops and/or new agriculture techniques, etc.*)

## 4.3 Other Water Requirement from West Banas Dam

Other than the irrigation purpose, 1.44 $Mm^3$ is required for industrial purpose.

## 4.4 Available Water for Irrigation Requirement in West Banas Dam

According to the 2.2, 2.4 and 4.3, available water for irrigation requirement in West Bans Dam can be estimated as 21.01 $Mm^3$ with 50% dependability.

26.04 $Mm^3$ (annual runoff with 50% dependability) – 3.59 $Mm^3$ (evaporation loss) - 1.44 $Mm^3$ (other requirement) = 21.01 $Mm^3$

## 4.5 Updated Cropping Pattern after Rehabilitation Works

Based on the above considerations as well as CAMP for soft component, the updated cropping pattern after rehabilitation works was prepared as shown below:

**Table 4.2 Updated Cropping Pattern**

| Crop with variety | Growing period | | Percentage of CCA | ha |
|---|---|---|---|---|
| | Optimum sowing Date | Optimum maturity Date | | |
| Rabi | | | | |
| i) Wheat | 1st Nov | 20th March | 17 | 1,352 |

| | | | | |
|---|---|---|---|---|
| ii) Musturd | 15th Oct | 30th January | 25 | 1,988 |
| iii) Barley | 1st Nov | 20th March | 0 | 0 |
| iv) Garm | 10th Nov | 20th January | 19 | 1.511 |
| v) Cumin | 15th Nov | 20th March | 17 | 1,352 |
| **Total** | | | **78** | **6,203** |

Details and guidelines for preparation of updated cropping pattern and calendar in DPR are described in CAMP for soft component.

### 4.6 Estimation of Effective Rainfall (Fortnightly)

Effective rainfall for crop water requirement was not considered because the irrigation water supply is planned only in Rabi season and rainfall during Rabi season is negligible.

### 4.7 Assessment of Crop Water Requirement

Crop water requirement based on updated cropping pattern was calculated using CROPWAT. Total crop water requirement was calculated as 2,216 ha-m details are shown in Annex 4.1.

### 4.8 Irrigation Water Requirement

Irrigation water requirement at the head of the canal system was estimated based on the following water conveyance efficiencies:

| | |
|---|---|
| Canal distribution system efficiency including Main, distributaries and minors | 93.50% |
| Field application efficiency Water course conveyance efficiency | 70.00% |

Total irrigation water requirement at head of canal system based on the crop water requirement shown in 4.7 and the above conveyance efficiencies was calculated as 21.00 $Mm^3$ (2,216 ha-m / 0.70 / 0.935 x 6,203 ha).

Based on available water for irrigation requirement in West Bans Dam as described in the above 4.4, the updated cropping pattern may be reasonable in respect of “water availability”. Meanwhile, as described in Section 1.3.3, the maximum irrigation intensity record during past 60 years was just only 56%, i.e. 4,453 ha, and the canal system should be re-designed based on latest command area survey to realize the above cropping pattern with intensity of irrigation of 78%, i.e. 6,203 ha.

### 4.9 Impact of Rehabilitation on Existing, On-going and Proposed Projects in the Basin

The rehabilitation works of the Sub-project will not include any works related to increase the capacity of dam reservoir and, therefore, will not cause any adverse impact to other projects in the basin.

# Chapter 5 Rehabilitation of Canal System

## 5.1 Design Criteria and Standards used for Survey and Design Works

xxxxxxxxxxxxxx.

*(Please describe the design criteria and standards used for survey and design works)*

## 5.2 General Features and Present Conditions of Irrigation Canal System

General features and present conditions of existing West Banas Irrigation Canal System are summarized as follows:

**Table 5.1 General Features of Irrigation Canal System**

| S. No. | Name of Canal | Category | Total length of Canal (m) | | | CCA (ha) | Design Discharge ($m^3$/sec) |
|---|---|---|---|---|---|---|---|
| | | | Lined | Unlined | Total | | |
| 1 | Right Main Canal | Main Canal | 34,633 | 107 | 34,740 | 4,221 | xxxxxxxxxxx |
| 2 | Left main Canal | Main Canal | 18,875 | 3,445 | 22,320 | 1,300 | xxxxxxxxxxx |
| 3 | Fula Bai ka Khera Minor | Minor | 2,340 | - | 2,340 | 532 | xxxxxxxxxxx |
| 4 | Sangwara Minor | Minor | 3,750 | - | 3,750 | 428 | xxxxxxxxxxx |
| 5 | Achpura Minor | Minor | 3,117 | 753 | 3,870 | 636 | xxxxxxxxxxx |
| 6 | Mungthala Minor | Minor | 4,890 | - | 4,890 | 524 | xxxxxxxxxxx |
| 7 | Kyaria Minor | Minor | 2,910 | - | 2,910 | 312 | xxxxxxxxxxx |
| | | **Total** | **70,515** | **4,305** | **74,820** | **7,952** | xxxxxxxxxxx |

## 5.3 Detailed Survey Works on Irrigation Canal System

xxxxxxxxxxxxxxxxxx.

*(Please describe the details of survey works for canal system such as the followings including location of bench marks, interval of sections, etc.)*

### 5.3.1 Long and Cross Sections Survey for Canals

Long and cross section survey for all the main canals and minor canals was made at the interval of every 50 m and results are shown in the Drawings no.....

### 5.3.2 Command Area Survey

Command area survey was made for the command area under all the main and minor canals and results are shown in the Drawings no.....

### 5.3.3 Inventory Survey for Canals and Canal Related Structures

Inventory survey for canals and canal related structures was made to check the detailed locations and conditions of the existing canals and canal related structures. Results of inventory survey for canals and canal related structures for all main and minor canals are shown in Annex 5.1.

## 5.4 Redesign of Canal System

As described in Sections 1.3.3 and 4.8, the maximum irrigation intensity record during past 60 years was just only 56%, i.e. 4,453 ha, and the canal system should be re-designed based on latest command area survey to realize the above cropping pattern with intensity of irrigation of 78%, i.e. 6,203 ha.

Based on the result of command area survey, cropping pattern and irrigation water requirement, the canal system including all main and minor canals was totally checked and re-designed as shown in the Drawings no..... and hydraulic profiles for all main and minor canals (Annex 5.2).

## 5.5 Rehabilitation of Irrigation Canals

### 5.5.1 Detailed Deficiencies in Irrigation Canals and Related Structures

As shown in the result of long and cross section survey and inventory survey described in the above 5.3, the following deficiencies were found in irrigation canal system in addition to the above 5.4:

i) Canal system including alignment of irrigation canals, capacity of irrigation canals at each reach, locations of outlet structures, etc. should be reviewed and redesigned to maximize the irrigation efficiency and intensity,
ii) Sediment and debris in the canal should be removed,
iii) Existing canal linings are deteriorated in many reaches,
iv) Existing earthen canals are seriously damaged and causes heavy workload for maintenance works and less irrigation efficiency,
v) Existing canal related structures are deteriorated,
vi) Existing unauthorized outlets should be removed, and
vii) Required facilities for proper water management should be installed.

### 5.5.2 Proposed Rehabilitation Works for Irrigation Canals

Based on the above 5.4 and 5.5.1, proposed rehabilitation works for irrigation canals are summarized as follows and details are shown in the Drawings no.....:

i) Rehabilitation of all main and minor canals in accordance with the alignments, dimensions and elevations designed and described in the layout plan, longitudinal profile and cross section drawings no..... with concrete lining as shown in the cross section drawings no.....
ii) Rehabilitation of existing Aqueduct structures as listed in the Drawings no ..... in accordance with the hydraulic and structure design shown in the Drawings no.....
iii) Rehabilitation of existing Siphon structures as listed in the Drawings no ..... in accordance with the hydraulic and structure design shown in the Drawings no.....
iv) Rehabilitation of existing Bridge structures as listed in the Drawings no ..... in accordance with the hydraulic and structure design shown in the Drawings no.....
v) Rehabilitation of existing Drop structures as listed in the Drawings no ..... in accordance with the hydraulic and structure design shown in the Drawings no.....
vi) Rehabilitation of existing Outlet structures as listed in the Drawings no ..... in accordance with the hydraulic and structure design shown in the Drawings no.....
vii) Construction of new structures as listed in the Drawings no ..... in accordance with the hydraulic and structure design shown in the Drawings no.....
viii) Provision of measuring devices as listed in the Drawings no ..... in accordance with the hydraulic and structure design shown in the Drawings no.....

The results of hydraulic calculations and hydraulic profiles for all canals after rehabilitation are shown in Annex 5.2 and Schematic Diagrams for Irrigation System, Structures and Water Level are shown in Drawings no....., respectively.

## 5.6 Introduction WUA Constructive Facilities

xxxxxxxxxxxxxxxxxxxxxxxxx

(*Please take the following actions and describe the results with required drawings*)

- *Orientation to the WUA members*
- *Walk-through survey with WUA members*
- *Facilities to be provided under RWSLIP with location and dimensions*
- *DRAWINGS*

## 5.7 Construction of Women Friendly Facilities and Trees

xxxxxxxxxxxxxxxxxxxxxxxxx

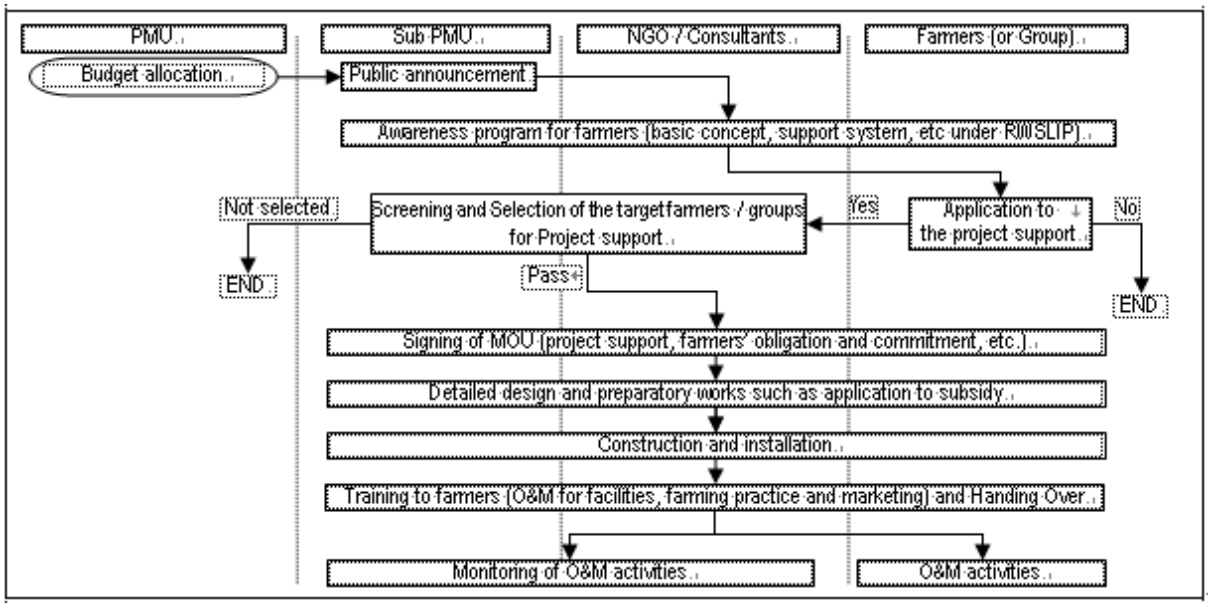
(*Please take the following actions and describe the results with required drawings*)

- *Orientation to the Women Wing members*

- *Walk-through survey with Women Wing members*
- *Facilities to be provided under RWSLIP with location and dimensions*
- *DRAWINGS*

## 5.8 Promotion of Micro Irrigation System

Micro irrigation system will be promoted in the Sub-project area with target area of 5% of total CCA. Details including target farmers will be decided after final screening of the Sub-project and allocation of budget by PMU based on the following flow chart:



# Chapter 6 Operation and Maintenance Plan

## 6.1 Current Situation for Operation and Maintenance in the Sub-project

West Banas sub-project is more than 51 years old system. WRD is the owner of the sub-project, and undertake maintenance, regulation, management etc. But, due to financial crunch, no budget is allocated for even normal repair and maintenance. Condition of canal network is regularly deteriorated due to deferred maintenance. Farmers particularly at tail are most dissatisfied about the performance of the system. Water distributions committees exist and their meetings are convened before start of Rabi irrigation. It is experienced that the beneficiaries are losing confidence with government agency and rift between farmers and Engineers is widening due to lack of services for smooth regulation of the system.

## 6.2 Operation and Maintenance Plan after Rehabilitation

### 6.2.1 Participatory Irrigation Management

Farmers' participation in the irrigation management is the most important and key factor. Rajasthan WRD has already initiated to evolve a partnership between the state and farmers in relation to irrigated agriculture through an act namely **"**Rajasthan Farmers Participation in Management of Irrigation Systems" 2000 and Rajasthan Farmers Participation in Management of Irrigation Systems Rules (RFPMIS Rules 2002) to provide effective role to farmers in the management and maintenance of irrigation systems. Role of farmers is of paramount importance and proposed to be extended top priority with a paradigm shift by transferring management authority of existing irrigation projects after their rehabilitation and capacity building of WUAs.

### 6.2.2 Strengthening of Capacity of WUA

Strengthening of capacity of WUA will be made through the activities under Component 2: Fostering and Capacity Enhancement of Water Users Organizations. For details, please see CAMP for soft component.

### 6.2.3 Fund for Operation and Maintenance

For proper and sustainable operation and maintenance works, collection of water fee is a key factor. Regarding the collection ratio, it is expected to improve through the activities under Component 2. In addition, it is strongly proposed to increase the amount of water fee up to INR 1,175 / ha as recommended by the 13$^{th}$ Finance Commission.

### 6.2.4 Guidelines and Manuals for Operation and Maintenance Works

Guidelines and manuals for operation and maintenance works will be prepared by the consultant for RWSLIP and distributed to the concerned agencies and WUA members. Operation and maintenance works should be made based on those guidelines and manuals and all WUA members and WRD field officers should well understand the contents.

PMU and the consultant will provide the following training program before handing over the facilities to WUA:

**Table Training on Operation and Maintenance**

| Timing | Target Officer | Trainer | Contents |
|---|---|---|---|
| Completion of each irrigation sub-project | Sub-PMU staff<br>WUA members | PMU staff/ consultant | O&M including water management based on guidelines and manuals to be prepared by the Consultant |

*Source: JICA survey team*

# Chapter 7 Construction Plan

## 7.1 Procurement Plan of the Construction Works

### 7.1.1 Basic Conditions for Procurement Plan under RWSLIP

Basic conditions for procurement plan under RWSLIP is as follows:

- Minimum amount for one contract package: INR 30 mil.
- Basic amount for one contract package: INR 50 mil. ~ 100 mil.
- Maximum amount of one contract package: INR 200 mil.

The construction period should be ranging from one year to two years in principle.

### 7.1.2 Packaging Plan

Considering the basic conditions shown in the above 7.1.1 and estimated cost of the Sub-project, the following packaging plan is prepared for implementation of the Sub-project:

**Table A 7.1 Packaging of the Sub-project**

| Package | Description | Estimated Amount (INR) |
|---|---|---|
| Package 1 | Civil Works for Rehabilitation of West Banas Dam and Right Main Canal System including Minor Canals | xxxxxxxxxxx |
| Package 2 | Civil Works for Rehabilitation of Left Main Canal System including Minor Canals | xxxxxxxxxxx |

## 7.2 Construction Schedule of the Sub-project

Considering the pre-construction works such as tender process, monsoon and water running period, the construction schedule was prepared as shown in the following figure:

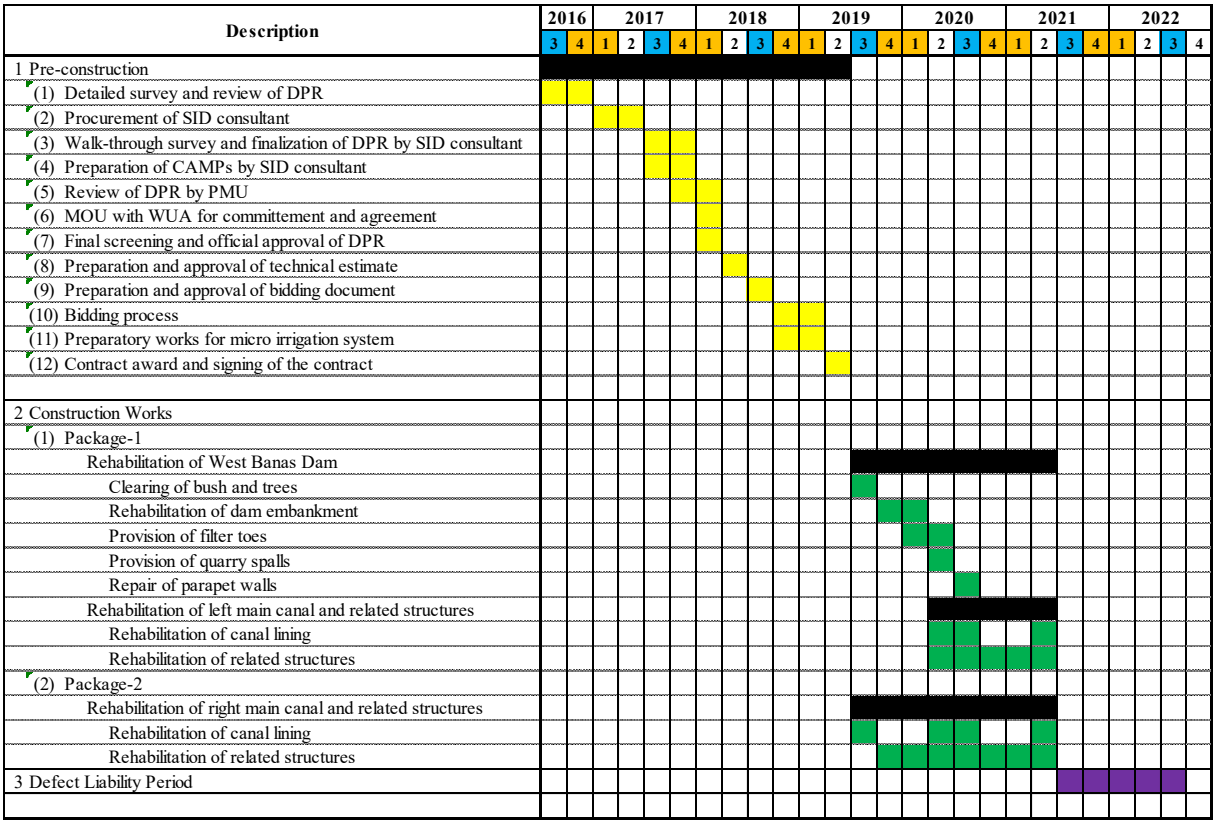



**Figure A 7.1 Construction Schedule of Rehabilitation of West Banas Irrigation Sub-project**

## 7.3 Organizational Structure for Construction Works

Organizational structure for construction works is shown in the following figure:

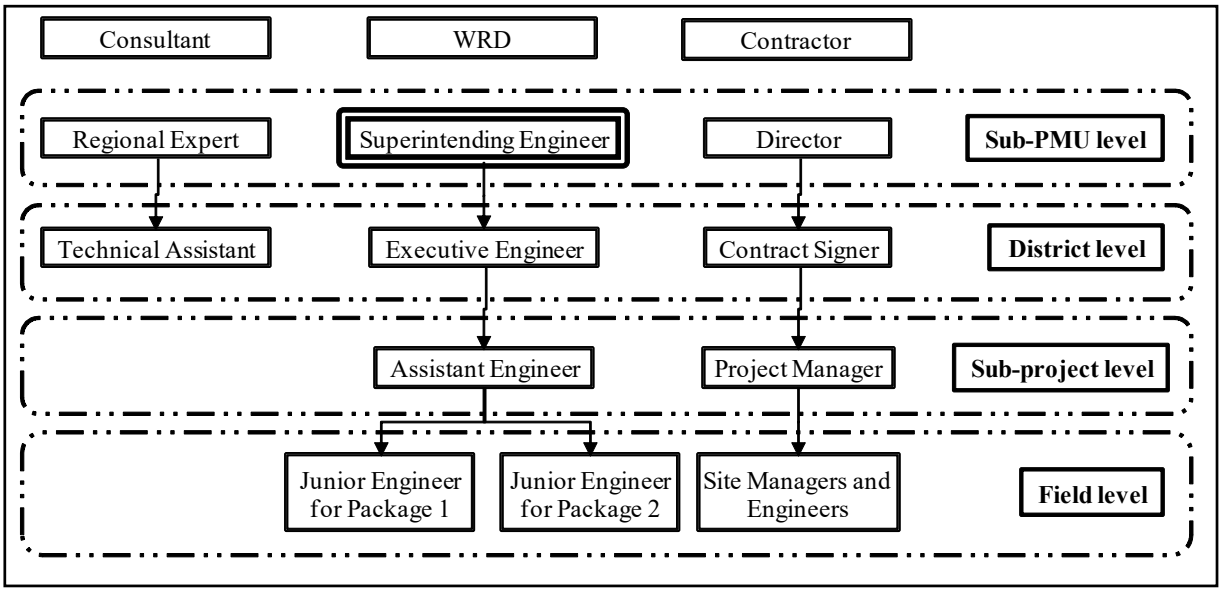



**Figure A 7.2 Organizational Structure for Construction Works**

## 7.4 Construction Management and Supervision

### 7.4.1 Guideline for Construction Management and Supervision under RWSLIP

Guideline for Construction Management and Supervision under RWSLIP issued by PMU will be applied to overall construction management and supervision including process of each activity, progress control, quality control and safety control.

### 7.4.2 Construction Meetings

The following regular and special construction meetings will be organized by relevant responsible sub-PMU staff under the Sub-project:

**Table A 7.2 Regular and Special Construction Meetings**

| Name | Frequency | Chairman | Member | Main agenda |
|---|---|---|---|---|
| Sub-PMU coordination committee | monthly | Superintending engineer | - Executive engineers<br>- Consultant<br>- Contractor (with delay or problem) | - report to sub-PMU about progress, quality and safety issues<br>- discussion and decision for important issues especially for delay of the works |
| Monthly construction meeting | monthly | Executive engineer | - Assistant engineers<br>- Consultant<br>- Contractor (project manager level) | - progress, quality and safety of the works<br>- decisions for required actions such as show cause meeting, warning letter, variation order, extension of time, contract amendment, etc. |
| Weekly constriction meeting | weekly | Assistant engineer | - Junior engineers<br>- Contractor (site manager level) | - progress, quality and safety of the works<br>- discussion for required actions such as show cause meeting, warning letter, variation order, extension of time, contract amendment, etc. |
| Special meeting | as required | Superintending engineer | - Executive engineers<br>- Consultant<br>- Contractor (project manager level) | - specific issues for discussion (delay of the works, low quality of the works, etc.) |

# Chapter 8 Environmental and Social Consideration

## 8.1 Screening for Environmental and Social Consideration before Preparation of DPR

Screening for environmental and social consideration was made before preparation of DPR. As shown in Attachment 1 of Executive Summary, *there will be no adverse impact on environmental and social issues by implementation of the Sub-project (Please check the result of screening and change the description, if required).*

## 8.2 Analysis and Monitoring of Impacts on Environmental and Social Issues

Based on the available data and information in this DPR as well as CAMP for soft components, the analysis of environmental impacts during the rehabilitation works was made as follows:

**Table A 8.1 Environment Impacts during Rehabilitation Works and Measures**

| Sl. | Environmental features | Adverse impacts | Mitigation Measures | Cost in INR |
|---|---|---|---|---|
| 1 | Water quality | xxxxxxxx | xxxxxxxx | xxxxxxxx |
| 2 | Noise and Air quality | xxxxxxxx | xxxxxxxx | xxxxxxxx |
| 3 | Soil quality, soil contamination, earth excavation, burrow pits etc. | xxxxxxxx | xxxxxxxx | xxxxxxxx |
| 4 | Felling of tree/ clearing of bushes, shrubs/ herbs | xxxxxxxx | xxxxxxxx | xxxxxxxx |
| 5 | Wildlife including birds and their habitat | xxxxxxxx | xxxxxxxx | xxxxxxxx |
| 6 | Domestic animals, grazing land/ pastures | xxxxxxxx | xxxxxxxx | xxxxxxxx |
| 7 | Waste management | xxxxxxxx | xxxxxxxx | xxxxxxxx |
| 8 | Any other | xxxxxxxx | xxxxxxxx | xxxxxxxx |

Based on the above analysis and also some key factors in other soft components activities, monitoring plan of environmental and social consideration was prepared as follows:

**Table A 8.2 Monitoring of Environmental and Social Consideration**

| Sl. | Activities for monitoring | Monitoring parameter | Location | Methods of monitoring | Time frame | In Charge | Cost in INR |
|---|---|---|---|---|---|---|---|
| 1 | Efficiency and effectiveness of Irrigation Infrastructure | xxxx | xxxx | xxxx | xxxx | xxxx | xxxx |
| 2 | Water quality | xxxx | xxxx | xxxx | xxxx | xxxx | xxxx |
| 3 | Soil quality | xxxx | xxxx | xxxx | xxxx | xxxx | xxxx |
| 4 | Application of chemical fertilizers and pesticides | xxxx | xxxx | xxxx | xxxx | xxxx | xxxx |
| 5 | Disposal of agriculture wastes | xxxx | xxxx | xxxx | xxxx | xxxx | xxxx |
| 6 | Use of eco-friendly materials and practices in agriculture | xxxx | xxxx | xxxx | xxxx | xxxx | xxxx |
| 7 | Participation of women in Project activities | xxxx | xxxx | xxxx | xxxx | xxxx | xxxx |
| 8 | Participation of ST in Project activities | xxxx | xxxx | xxxx | xxxx | xxxx | xxxx |
| 9 | Conservation of traditional seeds/ landraces | xxxx | xxxx | xxxx | xxxx | xxxx | xxxx |
| 10 | Conservation of forest, plantations, trees in the Catchment area | xxxx | xxxx | xxxx | xxxx | xxxx | xxxx |
| 11 | Green belt development | xxxx | xxxx | xxxx | xxxx | xxxx | xxxx |
| 12 | Tree planting by farmers on their own land | xxxx | xxxx | xxxx | xxxx | xxxx | xxxx |
| 13 | Dam safety (in case of big dams) | xxxx | xxxx | xxxx | xxxx | xxxx | xxxx |
| 14 | Any other activities | xxxx | xxxx | xxxx | xxxx | xxxx | xxxx |

# Chapter 9 Economic Evaluation

## 9.1 General

Economic evaluation was carried out to access the economic viability of each sub-project of the Project from a viewpoint of national economy. In order to evaluate the Project, such indicators as the economic internal rate of return (EIRR), cost-benefit ratio (B/C) and net present value (B-C) was calculated by estimating the cash outflow (costs) and inflow (benefits) on annual basis over sub-project life with a certain discount rate. EIRR is a discount rate at which the present value of the in and out cash flows become equal. This rate shows the return to be expected from the Project as expressed in the following equation.

$$\sum_{t=0}^{n} C_t / (1+r)^t - \sum_{t=0}^{n} B_t / (1+r)^t = 0$$

Where,

| | | |
|---|---|---|
| $C_t$ | : | Cost |
| $B_t$ | : | Benefit |
| t | : | Year |
| n | : | Project life (year) |
| r | : | Discount rate (= EIRR) |

## 9.2 Basic Assumptions

The above mentioned economic evaluation indicators are estimated with the following conditions and assumptions:

i) **Project life:** Project life is assumed to be 30 years;

ii) **Discount rate:** Discount rate of 12% is applied for calculation of B/C and B-C, which is the standard for appraisal of World Bank and Asian Development Bank;

iii) **Traded outputs:** Maize, wheat and barley is treated as traded outputs (export goods). Economic prices of them are estimated based on f.o.b. (free on board) price calculated from trade statistics (excluding taxes and duties) derived from the "Export Import Data Bank, Department of Commerce" and expressed in 2016 constant price;

iv) **Nontradable commodities:** Standard conversion factor (SCF) of 0.96 are applied for converting from financial prices of nontradable commodities to economic prices which was calculated based on trade statistics of India.;

v) **Labour:** Shadow wage rate (SWR) for unskilled labour of 0.9 are applied for converting market wage rate to their economic prices;

vi) **Economic Price:** All financial prices shall be converted to economic price by using the above mentioned prices and factors. Transfer payment (taxes and subsidies), land acquisition, compensation, price escalation and interest during construction are excluded for calculation of economic project cost/benefit.

vii) **Economic Cost:** For calculation of the project economic cost, only incremental cost shall be counted. Sunk cost is not included in economic cost; and

viii) **Economic Benefit:** For calculation of the project benefit, only tangible direct benefits of irrigation are counted and no indirect and intangible benefits are taken into account.

## 9.3 Project Cost

### 9.3.1 Cost estimate

The construction cost is estimated as shown in Volume-2 of Cost Estimates and as summarized in Table A 9.1, which was based on the latest available version of the BSR (2014).

An allowance of 5% for physical contingencies for any unforeseen work. The construction cost established was surcharged by the inflation in the construction sector for years 2015/2016 which was assumed as 6%. The cost of employment of the consultant and SID works was surcharged to the updated (2016) construction cost at a total of 6%, consisting of the following:

- SID contracts 1.5 %
- Consultant 4.5 %
- Total 6.0 %

**Table A 9.1 Abstract of Cost for Rehabilitation of West Banas Irrigation Sub-project**

| No. | Description (Proposed Activity) | Estimated Cost (INR thousand) |
|---|---|---|
| 1 | Rehabilitation of West Banas Dam | |
| 1.1 | Dam body and intake structure | xxx |
| 1.2 | Spillway (rehabilitation of downstream walls at settling basin) | xxx |
| 1.3 | Provision of filter toe | xxx |
| | Sub-total 1 | xxx |
| 2 | Rehabilitation of Irrigation Canal System (Right Main Canal) | |
| 2.1 | Rehabilitation of existing canal lining | xxx |
| 2.2 | Construction/rehabilitation of related structures | xxx |
| | Sub-total 2 | xxx |
| 3 | Rehabilitation of Irrigation Canal System (Left Main Canal) | |
| 3.1 | Rehabilitation of existing canal lining | xxx |
| 3.2 | Provision of new canal lining | xxx |
| 3.3 | Construction/rehabilitation of related structures | xxx |
| | Sub-total 3 | xxx |
| 4 | Rehabilitation of Irrigation Canal System (Minor Canals) | |
| 4.1 | Rehabilitation of existing canal lining | xxx |
| 4.2 | Construction/rehabilitation of related structures | xxx |
| | Sub-total 4 | xxx |
| 5 | Promotion of Micro Irrigation System (target area to be developed) | |
| 5.1 | Construction and installation of community based sprinkler system | xxx |
| 5.2 | Construction and installation of individual farmer based drip system | xxx |
| | Sub-total 5 | xxx |
| 6 | Construction of WUA Constructive Facilities | |
| 6.1 | Construction of xxxxxxx at xxxxxxx | xxx |
| | Sub-total 6 | xxx |
| 7 | Support for Gender Mainstreaming Activities | |
| 7.1 | Construction of xxxxxx at xxxxxx | xxx |
| 7.2 | Construction of xxxxxx at xxxxxx | xxx |
| 7.3 | Planting of xxxxxx at xxxxxx | xxx |
| 7.4 | Planting of xxxxxx at xxxxxx | xxx |
| | Sub-total 7 | xxx |
| | **Total (1 - 7)** | **xxx** |

### 9.3.2 Annual O&M Cost

For the economic evaluation, only incremental O&M cost is counted. Annual operation and maintenance (O&M) cost of the Project was estimated based on required O&M expenditure per ha recommended by the 13th Finance Commission and actual expenditure for O&M from both WUA and

GOR. Accordingly, annual O&M cost is assumed to be INR 1,175 per ha (financial price) and INR 1,128 per ha (economic price). Total annual O&M cost for the sub-project is INR 6,997 thousand.

### 9.3.3 Economic Capital Cost

Economic capital cost was calculated based on the financial capital cost by applying above mentioned conversion factors. Construction cost was divided into two parts, 1) construction materials/skilled labour cost and 2) unskilled labour cost. Different conversion factor was applied for 1) and 2). Prise escalation cost in the future was excluded for economic cost estimation. Economic capital costs to be considered are the following:

- Construction cost with physical contingencies (5% of construction cost) at 2016 price level converted to economic cost with SCF and SWR,
- Cost of SID works converted to economic cost with SCF, and
- Cost of consultancy (E&M, M&E) converted to economic cost with SCF.

## 9.4 Project Benefit

### 9.4.1 Cropping Pattern

The benefit from irrigation water supply of the Project is the increment of net production value of crops derived from increasing of cropping intensity and unit yield of cereals, pulses, oil seed and other crops comparing without and with project condition. Cropping patter with and without rehabilitation is shown in Annex 9.1: Cropping Areas - with/without Rehabilitation.

### 9.4.2 Crop Budget

Economic Crop budget of major crops were prepared for estimation of irrigation benefit of the sub-project as shown in Annex 9.2: Cost of Inputs, Crop Yields and other Parameters. These crop budget are estimated based on the following assumptions:

i) Crop budget are prepared for Kharif cereals (maize, sorgham and pearl millet), Kharif beans (Moong), Kharif oilseed (Sesame and groundnut), Kharif cotton, Rabi cereals (wheat and barley), rabi beans (gram), rabi oilseed (Mustard);

ii) Crop budget of onion, which has the largest cultivation area among vegetable in Rajastahn typified other high value crops due to lack of reliable data of cost of cultivation;

iii) Crop budget of the project also does not separate irrigated and un-irrigated condition (Average figure includes both irrigated and un-irrigated condition);

iv) Crop budget are prepared based on the following sources,

Price: Average Price of 2009-14 five year data at price in 2016, Rajasthan Agricultural Statistics at a Glance 2013-14, published Nov. 2015, DoA, Rajasthan
Yield: Ave. 5 years data upto 2012-13, Rajasthan Agricultural Statistics at a Glance 2013-14, published Nov. 2015, DoA, Rajasthan
Cost of Cultivation: 2012-13 data, Estimates of Cost of Cultivation/Production & Related Data, Directorate of Economics & Statistics

v) Prices of agro commodities are converted from wholesale price to farm gate price by deducting marketing cost;

vi) All prices are expressed in 2016 constant prices by converting with consumer price index;

vii) Material cost are estimated to have 20% of subsidy for seeds and/or fertilizers based on subsidy rate for seeds in Rajasthan. Material cost are also estimated to include 5.5% of Value Added Tax (VAT), which are deducted from material cost;

viii) Figure of crop budget are converted to economic prices based on above mentioned assumptions and procedures;

ix) Irrigation charge of cultivation cost are included in O&M cost and not included in production cost;

x) Crop budget with above mentioned conversion are assumed as crop budget without project conditions;

xi) Increase in production of 10% for wheat, barley & gram and 5% of maize, mustard & other crops are anticipated for the crop budget with condition due to availability of stable water supply by rehabilitation of irrigation facilities and agricultural extension activities by the Project. Increase of 5% of labour cost and material inputs are anticipated with condition due to more intensive use of irrigation water, introduction of recommended variety and increase of fertilizer inputs.

### 9.4.3 Net Project Benefit

In accordance with "without" and "with" cropping pattern in the project area and crop budget, annual project benefit is estimated. Economic benefit from irrigation development is estimated at Rs. x,xxx million per annum. Calculation result of net project benefit is shown in Annex 9.3: Value of Crop and Cost of various Inputs (Without-Rehabilitation) and Annex 9.4: Annual Net Receipt (Total Gross Margin).

## 9.5 Calculation of EIRR

EIRR is calculated from the cash flow table at xx.x% with INR x,xxx million of B-C and 1.xx of B/C, as summarized in Table 9.2. Cash flow table for calculation of EIRR and calculation of benefit cost ratio is shown in Annex 9.5: Cash Flow Schedule and EIRR and Annex 9.6: Calculation of Benefit Cost Ratio, respectively.

**Table A 9.2 Economic Evaluation Results**

| Name of Sub-project | EIRR (%) | Net Present Value | | | B/C |
|---|---|---|---|---|---|
| | | Benefit | Cost | B-C | |
| West Banas Irrigation Sub-project | xxxx | xxxxx | xxxx | xxxx | xxxx |

# *Annexure*

## Annex 1.1 Walk-through Survey Report

Name of the Sub-project:

Date:

Participants (with signature for attendance):

| Organization | Name of Participants | Signature |
|---|---|---|
| WRD | | |
| | | |
| DoA | | |
| | | |
| DoH | | |
| | | |
| WCD | | |
| | | |
| WUA | | |
| | | |
| Women Wing | | |
| | | |
| SID consultant | | |
| | | |
| The consultant | | |
| | | |
| NGO | | |
| | | |

## Findings through Walk-through Survey

1. Rehabilitation of Irrigation Facilities (Present Conditions and Constraints)

| Location | Findings |
|---|---|
| | |
| | |
| | |

2. Promotion of Micro Irrigation System (Intension of Farmers)

| Location | Findings |
|---|---|
| | |
| | |
| | |

*Note: farmers' intension to install micro irrigation system including cultivated crops should be confirmed.*

3. Introduction of WUA Facilities (WUA Activities)

| Location | Findings |
|---|---|
| | |
| | |
| | |
| | |

*Note: location and detailed specifications of WUA facilities such as dimensions, etc. proposed and agreed in "ORIENTATION" should be checked.*

4. Women Friendly Activities (Facilities and Trees) for Gender Mainstreaming

| Location | Findings |
|---|---|
| | |
| | |
| | |
| | |

*Note: location and details of women friendly facilities and trees. proposed and agreed in "ORIENTATION" should be checked.*

5. Agriculture, Agro-processing and Marketing Activities

| Location | Findings |
|---|---|
| | |
| | |
| | |
| | |

*Note: should be checked based on CAMP for Sub-PMU 3: Udaipur and Jodhpur Zones*

## Confirmed and signed by

| | | |
|---|---|---|
| Assistant Engineer, WRD | Assistant Director, DoA | Assistant Director, DoH |
| Assistant Director, WCD | President, WUA | Leader, Women Wing |
| SID Consultant | The Consultant | NGO |

# Annex 2.1 Unit Hydrograph and Calculations for SPF/PMF

WEST BANAS IRRIGATION PROJECT, PINDWARA/ABUROAD,SIROHI

| S.No. | Particulars | DETAILS | |
|---|---|---|---|
| **1** | Name Of Project | **WEST BANAS IRRIGATION PROJECT** | |
| **2** | Gauge -Discharge Site | WEST BANAS | |
| **3** | Latitude | $24^0$ 41' 30" | |
| **4** | Longitude | $72^0$ 57' 35" | |
| **5** | Tehsil | Pindwara, | |
| **6** | District | SIROHI | |
| **7** | Basin | West Banas | |
| **8** | Gross Catchment Area | 515.00 | Sq.Km. |
| **9** | Intercepted Catchment Area | 98.00 | Sq.Km. |
| **10** | Free Catchment Area | 417.00 | Sq.Km. |
| **12** | Catchment Area For Yield Calculation | 417.00 | Sq.Km. |

WEST BANAS IRRIGATION PROJECT

Computation of Equivalent Slope of stream

| **Latitude** | $24^0$ 20' 30" | | Longitude | $75^0$ 59' 35" | | |
|---|---|---|---|---|---|---|
| **S. No.** | Distance from dam site | Reduced level of river bed | Length of each segment (Li) | Height above datum Di | (Di-1+Di) | Li(Di-1+D1) |
| | (km) | (m) | (km) | (m) | (m) | (m*km) |
| 1 | **2** | **3** | **4** | **5** | **6** | **7** |
| **1** | 0.00 | 327.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| **2** | 5.98 | 337 | 5.98 | 10.00 | 10.00 | 59.80 |
| **3** | 7.43 | 342 | 1.45 | 15.00 | 25.00 | 36.25 |
| **4** | 8.24 | 347 | 0.81 | 20.00 | 35.00 | 28.35 |
| **5** | 12.95 | 357 | 4.71 | 30.00 | 50.00 | 235.50 |
| **6** | 15.72 | 368 | 2.77 | 41.00 | 71.00 | 196.67 |
| **7** | 17.98 | 377 | 2.26 | 50.00 | 91.00 | 205.66 |
| **8** | 21.68 | 389 | 3.7 | 62.00 | 112.00 | 414.40 |
| **9** | 23.37 | 393 | 1.69 | 66.00 | 128 | 216.32 |
| **10** | 24.66 | 399 | 1.29 | 72.00 | 138 | 178.02 |
| **11** | 25.66 | 401 | 1 | 74.00 | 146 | 146.00 |
| **$L^2$ =** | 658.44 | | | | | 1716.97 |
| **Equivalent slope of stream =Sum Li(Di-1+Di)/$L^2$** | | | | = | 2.61 | m/km |

## Derivation of 1-hr. Synthetic Unit Hydrograph (SUG):

### Computation of 1hr. U.G. parameters.

**For Chambal sub-zone : 1(a)**

**1 - Input data :-**

| | | | |
|---|---|---|---|
| tr = | **1** | hr. | |
| Area A = | **414.00** | Sq.km. | |
| Length L = | **12.95** | km. | |
| Eq.Slope S= | **2.61** | m/km. | |

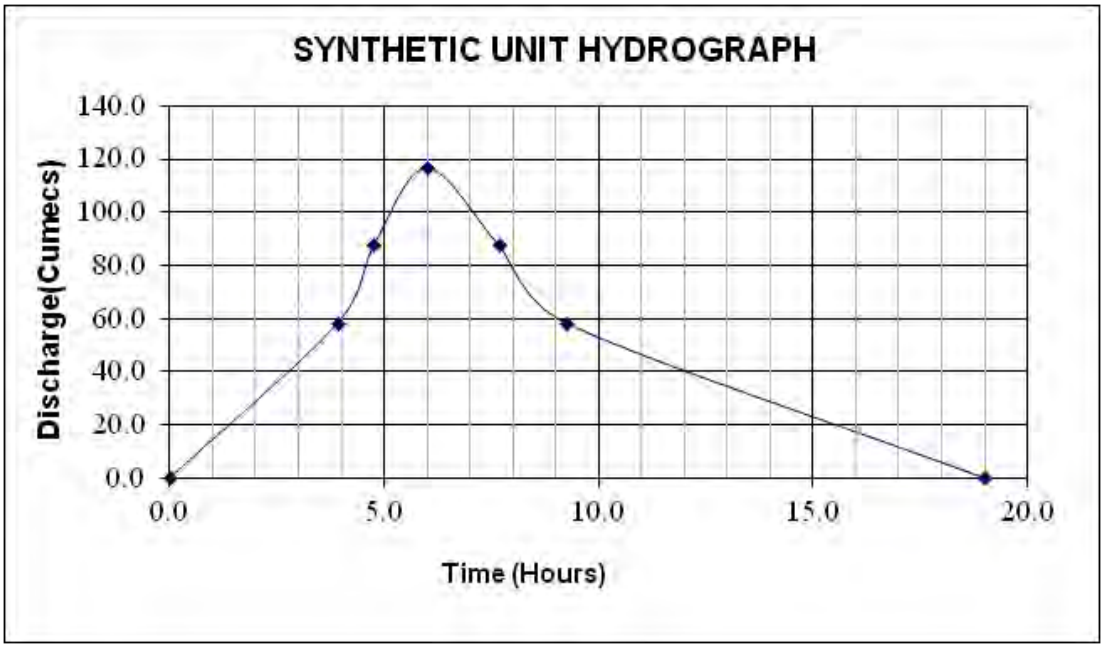
**2 - Compution of Physiographic parameters :-**

| | | | say | | SUG Coordinates | |
|---|---|---|---|---|---|---|
| | | | | | **X** | **Y** |
| $t_p$ = | $0.339(L/S^{1/2})^{0.826}$ = | 1.892 | **5.50** | hrs. | | |
| $q_p$ = | $1.251(t_p)^{-0.610}$ = | 0.427 | | CUMECS/SQ KM | 0 | 0 |
| $W_{50}$ = | $2.215(q_p)^{-1.034}$ = | 5.33 | | hrs. | 3.92 | 58.391 |
| $W_{75}$ = | $1.191(q_p)^{-1.057}$ = | 2.92 | | hrs. | 4.76 | 87.586 |
| $W_{R50}$ = | $0.834(q_p)^{-1.077}$ = | 2.08 | | hrs. | 6 | 116.781 |
| $W_{R75}$ = | $0.502(q_p)^{-1.065}$ = | 1.24 | | hrs. | 7.68 | 87.586 |
| $T_b$ = | $6.662(t_p)0^{.613}$ = | 18.82 | **19** | hrs. | 9.25 | 58.391 |
| $T_m$ = | $t_p + t_r/2$ = | 6 | **6** | hrs. | 19 | 0 |
| $Q_p$ = | $q_p$ x A = | 116.781 | | Cumecs | | |
| $T_D$ = | 1.1 x tp = | 6.05 | **7** | hrs. | | |

**3 - Drawing of Synthetic Unitgraph**

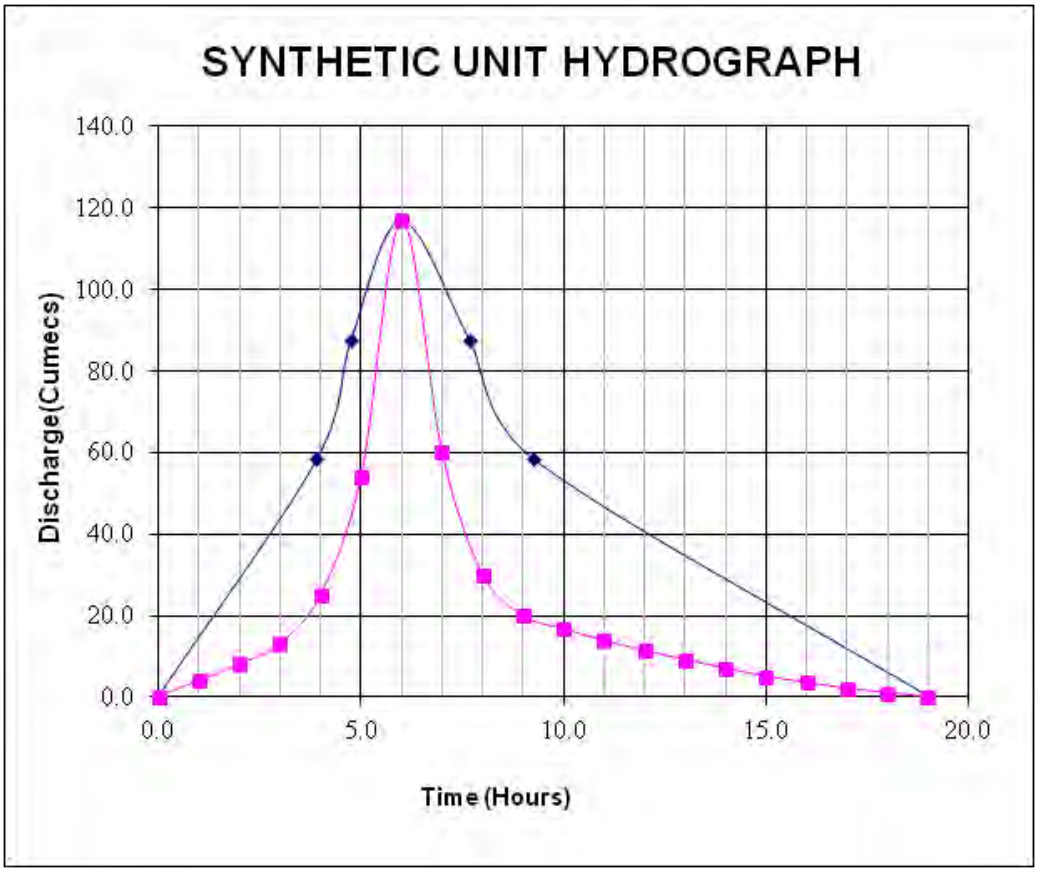
With the help of estimated parameters unit graph is drawn.
The discharge ordinates of unit graph at ti = tr interval are summed up
and multiplied by tr = 1and compared with the volume of 1cm Direct
runoff depth over the catchment with the formula Qi * ti =A*d/ti*.36.
Shape of unitgraph is adjusted to satsfy the formula.

**<Qi * ti =** **1089.474** Cumecs



4 - Adjusted Unit Graph :-

| SUG Coordinates | | Time in Hrs. | 1-hr.SUG Ordinates |
|---|---|---|---|
| X | Y | 0 | 0 |
| 0 | 0 | 1 | 4 |
| 3.92 | 58.391 | 2 | 8 |
| 4.76 | 87.586 | 3 | 13.0 |
| 6 | 116.781 | 4 | 25 |
| 7.68 | 87.586 | 5 | **54.0** |
| 9.25 | 58.391 | 6 | **117** |
| 19 | 0 | 7 | **60** |
| | | 8 | **30** |
| | | 9 | **19.9** |
| | | 10 | **16.6** |
| | | 11 | **13.80** |
| | | 12 | **11.3** |
| | | 13 | **9.083** |
| | | 14 | **7** |
| | | 15 | **5** |
| | | 16 | **3.5** |
| | | 17 | **2** |
| | | 18 | **1** |
| | | 19 | **0** |
| | | 1089.474 | 400.183 |



| | | | | | | |
|---|---|---|---|---|---|---|
| **1-** | **Time Distribution of SPS :** | | **WEST BANAS IRRIGATION PROJECT** | | | |
| | **Catchment Area(Gross)** | | | | 414 | Sq.Km. |
| | SPS Value computed as per Table vol 1(a) = | | | | **36.00** | **cm** |
| | Clock Hour Correction@15% | | | | **1.15** | |
| | Therefore One day areal PMP value =1.15x36 | | | | **41.40** | **cm** |
| | Rainfall during first 12 hrs. = | | | | **28.98** | **cm** |
| | Rainfall during second 12 hrs. = | | | | **12.42** | **cm** |
| | | | | | | |
| **A.** | **Rainfall distribtion for first 12 hrs. :-** | | | | | |
| | **Hour** | **% of R.F.** | **1-hr storm** | **Rainfall** | **Loss rate** | **1-hr effec.** |
| | | **distribution** | **Rainfall** | **increments** | | **Rainfall** |
| | | **co-eff.** | **cm** | **cm** | **cm/hr** | **cm** |
| | **1** | **2** | **3** | **4** | **5** | **6** |
| | 1 | 22.86 | 6.62 | 6.62 | 0.17 | 6.45 |
| | 2 | 37.14 | 10.76 | 4.14 | 0.17 | 3.97 |
| | 3 | 50.00 | 14.49 | 3.73 | 0.17 | 3.56 |
| | 4 | 58.57 | 16.97 | 2.48 | 0.17 | 2.31 |
| | 5 | 65.71 | 19.04 | 2.07 | 0.17 | 1.90 |
| | 6 | 71.43 | 20.70 | 1.66 | 0.17 | 1.49 |
| | 7 | 77.14 | 22.36 | 1.66 | 0.17 | 1.49 |
| | 8 | 81.43 | 23.60 | 1.24 | 0.17 | 1.07 |
| | 9 | 87.14 | 25.25 | 1.66 | 0.17 | 1.49 |
| | 10 | 92.86 | 26.91 | 1.66 | 0.17 | 1.49 |
| | 11 | 95.71 | 27.74 | 0.83 | 0.17 | 0.66 |
| | 12 | 100.00 | 28.98 | 1.24 | 0.17 | 1.07 |
| | | | | | | |
| **A.** | **Rainfall distribution for Second 12 hrs. :-** | | | | | |
| | **Hour** | **% of R.F.** | **1-hr storm** | **Rainfall** | **Loss rate** | **1-hr effec.** |
| | | **distribution** | **Rainfall** | **increments** | | **Rainfall** |
| | | **co-eff.** | **cm** | **cm** | **cm/hr** | **cm** |
| | **1** | **2** | **3** | **4** | **5** | **6** |
| | 1 | 10.00 | 1.24 | 1.24 | 0.17 | 1.07 |
| | 2 | 20.00 | 2.48 | 1.24 | 0.17 | 1.07 |
| | 3 | 26.67 | 3.31 | 0.83 | 0.17 | 0.66 |
| | 4 | 36.67 | 4.55 | 1.24 | 0.17 | 1.07 |
| | 5 | 43.33 | 5.38 | 0.83 | 0.17 | 0.66 |
| | 6 | 53.33 | 6.62 | 1.24 | 0.17 | 1.07 |
| | 7 | 60.00 | 7.45 | 0.83 | 0.17 | 0.66 |
| | 8 | 70.00 | 8.69 | 1.24 | 0.17 | 1.07 |
| | 9 | 76.67 | 9.52 | 0.83 | 0.17 | 0.66 |
| | 10 | 86.67 | 10.76 | 1.24 | 0.17 | 1.07 |
| | 11 | 93.33 | 11.59 | 0.83 | 0.17 | 0.66 |
| | 12 | 100.00 | 12.42 | 0.83 | 0.17 | 0.66 |
| | | | | | | |

**3- Estimation of SPF :-** **Table - 6**

**a) Computation of first peak value :**

| **Time (Hrs)** | **UG ordinates** | **1-hr effec. RF in cms** | **Direct run-off cumecs** | |
|---|---|---|---|---|
| **1** | **2** | **3** | **4** | |
| 1 | 4.00 | 0.66 | 2.64 | |
| 2 | 8.00 | 1.07 | 8.56 | |
| 3 | 13.00 | 1.49 | 19.37 | |
| 4 | 25.00 | 1.49 | 37.25 | |
| 5 | 54.00 | 3.56 | 192.24 | |
| 6 | 117.00 | 6.45 | 754.65 | |
| 7 | 60.00 | 3.97 | 238.20 | |
| 8 | 30.00 | 2.31 | 69.30 | |
| 9 | 19.90 | 1.90 | 37.81 | |
| 10 | 16.60 | 1.49 | 24.73 | |
| 11 | 13.80 | 1.49 | 20.56 | |
| 12 | 11.30 | 1.07 | 12.09 | |
| | | Direct runoff = | **1417.41** | cumecs |
| | | Base flow = | **14.93** | cumecs |
| | First peak value = | | **1432.34** | cumecs |

**a) Computation of second peak value :**

| **Time (Hrs)** | **UG ordinates** | **1-hr effec. RF in cms** | **Direct run-off cumecs** | |
|---|---|---|---|---|
| **1** | **2** | **3** | **4** | |
| 1 | 4.00 | 0.66 | 2.64 | |
| 2 | 8.00 | 0.66 | 5.28 | |
| 3 | 13.00 | 0.66 | 8.58 | |
| 4 | 25.00 | 1.07 | 26.75 | |
| 5 | 54.00 | 1.07 | 57.78 | |
| 6 | 117.00 | 1.07 | 125.19 | |
| 7 | 60.00 | 1.07 | 64.20 | |
| 8 | 30.00 | 1.07 | 32.10 | |
| 9 | 19.90 | 1.07 | 21.29 | |
| 10 | 16.60 | 0.66 | 10.96 | |
| 11 | 13.80 | 0.66 | 9.11 | |
| 12 | 11.30 | 0.66 | 7.46 | |
| | | Direct runoff = | **371.34** | cumecs |
| | | Base flow = | 14.93 | cumecs |
| | First peak value = | | **386.26** | cumecs |

# Annex 3.1 Stability Calculations for Earthen Dam

WEST BANASIRRIGATION PROJECT

UPSTREAM SLOPE STABILITY ANALYSIS

(U/S)STEADY SEEPAGE AT (NSL) 1. WITHOUT EARTHQUAKE

| | | |
|---|---|---|
| POOL ELEVATION = | 334.45 | metres |
| GROUND LEVEL = | 321.5 | metres |
| ALL CIRCLES TOUCH AT ELEVATION = | 321.5 | metres |
| ACCELERATION COEFFICIENT | | |
| HORIZONTAL ACCELERATION COEFFICIENT = | 0.00 | |
| VERTICAL ACCELERATION COEFFICIENT = | 0.00 | |
| MINIMUM FACTOR OF SAFETY = | 2.18 | |

SAFETY FACTOR TABLE

| S. NO. | X-CO-ORD | Y-CO-ORD | RADIUS | INT.POINT $X_1$ | INT.POINT $X_2$ | SIGMA FRICTION | SIGMA SLIDING | F.O.S |
|---|---|---|---|---|---|---|---|---|
| 1 | 223.31 | 344.81 | 23.31 | 210.84 | 245.10 | 190.09 | 73.67 | 2.58 |
| 2 | 225.31 | 344.81 | 23.31 | 212.17 | 247.29 | 212.92 | 90.23 | 2.36 |
| 3 | 227.31 | 344.81 | 23.31 | 213.53 | 249.29 | 238.70 | 107.38 | 2.22 |
| 4 | 229.31 | 344.81 | 23.31 | 214.92 | 251.29 | 267.13 | 122.74 | 2.18 |
| 5 | 231.31 | 344.81 | 23.31 | 216.34 | 253.18 | 291.26 | 131.37 | 2.22 |
| 6 | 231.31 | 346.81 | 25.31 | 215.84 | 254.29 | 307.01 | 135.55 | 2.26 |
| 7 | 233.31 | 346.81 | 25.31 | 217.25 | 255.90 | 338.70 | 141.80 | 2.39 |
| 8 | 229.31 | 346.81 | 25.31 | 214.46 | 252.65 | 282.24 | 128.04 | 2.20 |
| 9 | 227.31 | 346.81 | 25.31 | 213.10 | 250.66 | 257.97 | 118.15 | 2.18 |
| 10 | 225.31 | 346.81 | 25.31 | 211.77 | 248.66 | 229.89 | 101.34 | 2.27 |
| 11 | 225.31 | 342.81 | 21.31 | 212.60 | 245.74 | 196.38 | 78.72 | 2.49 |
| 12 | 227.31 | 342.81 | 21.31 | 214.00 | 247.82 | 219.78 | 95.71 | 2.30 |
| 13 | 229.31 | 342.81 | 21.31 | 215.43 | 249.82 | 245.95 | 111.73 | 2.20 |
| 14 | 231.31 | 342.81 | 21.31 | 216.88 | 251.82 | 268.46 | 120.73 | 2.22 |

WEST BANASIRRIGATION PROJECT

UPSTREAM SLOPE STABILITY ANALYSIS

(U/S)STEAGE BELOW(NSL) 2 WITHOUT EARTHQUAKE

| | | |
|---|---|---|
| POOL ELEVATION = | 334.45 | metres |
| GROUND LEVEL = | 321.5 | metres |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| ALL CIRCLES TOUCH AT ELEVATION = | | | | | | 319.5 | metres | | |
| ACCELERATION COEFFICIENT | | | | | | | | | |
| HORIZONTAL ACCELERATION COEFFICIENT = | | | | | | 0.00 | | | |
| VERTICAL ACCELERATION COEFFICIENT = | | | | | | 0.00 | | | |
| | | | | | | | | | |
| MINIMUM FACTOR OF SAFETY = | | | | | | 1.91 | | | |

SAFETY FACTOR TABLE

| S.NO. | X-CO-ORD | Y-CO-ORD | RADIUS | INT.POINT $X_1$ | INT.POINT $X_2$ | SIGMA FRICTION | SIGMA SLIDING | F.O.S | |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 220.31 | 345.81 | 26.31 | 206.24 | 244.91 | 210.56 | 93.86 | 2.24 | |
| 2 | 222.31 | 345.81 | 26.31 | 207.56 | 247.12 | 229.28 | 107.74 | 2.13 | |
| 3 | 224.31 | 345.81 | 26.31 | 208.92 | 249.12 | 254.43 | 128.35 | 1.98 | |
| 4 | 226.31 | 345.81 | 26.31 | 210.30 | 251.12 | 276.92 | 141.46 | 1.96 | |
| 5 | 228.31 | 345.81 | 26.31 | 211.71 | 253.04 | 304.45 | 159.40 | 1.91 | |
| 6 | 230.31 | 345.81 | 26.31 | 213.14 | 254.72 | 328.84 | 167.12 | 1.97 | |
| 7 | 230.31 | 347.81 | 28.31 | 212.62 | 255.78 | 344.10 | 170.34 | 2.02 | |
| 8 | 232.31 | 347.81 | 28.31 | 214.05 | 257.38 | 365.15 | 171.19 | 2.13 | |
| 9 | 228.31 | 347.81 | 28.31 | 211.22 | 254.16 | 319.57 | 164.61 | 1.94 | |
| 10 | 226.31 | 347.81 | 28.31 | 209.84 | 252.49 | 297.78 | 154.07 | 1.93 | |
| 11 | 224.31 | 347.81 | 28.31 | 208.49 | 250.49 | 273.67 | 141.40 | 1.94 | |
| 12 | 224.31 | 343.81 | 24.31 | 209.38 | 247.66 | 233.61 | 114.54 | 2.04 | |
| 13 | 226.31 | 343.81 | 24.31 | 210.79 | 249.66 | 259.85 | 134.70 | 1.93 | |
| 14 | 228.31 | 343.81 | 24.31 | 212.23 | 251.66 | 281.75 | 146.35 | 1.93 | |
| 15 | 230.31 | 343.81 | 24.31 | 213.69 | 253.52 | 305.43 | 156.20 | 1.96 | |

WEST BANASIRRIGATION PROJECT

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| UPSTREAM SLOPE STABILITY ANALYSIS | | | | | | | | | |
| | | | | | | | | | |
| (U/S)STEAGE BELOW(NSL) 2 | | | | WITHOUT EARTHQUAKE | | | | | |
| | | | | | | | | | |
| POOL ELEVATION = | | | | | | 334.45 | metres | | |
| | | | | | | | | | |
| GROUND LEVEL = | | | | | | 321.5 | metres | | |
| ALL CIRCLES TOUCH AT ELEVATION = | | | | | | 319.5 | metres | | |
| ACCELERATION COEFFICIENT | | | | | | | | | |
| HORIZONTAL ACCELERATION COEFFICIENT = | | | | | | 0.00 | | | |
| VERTICAL ACCELERATION COEFFICIENT = | | | | | | 0.00 | | | |
| | | | | | | | | | |
| MINIMUM FACTOR OF SAFETY = | | | | | | 1.91 | | | |

SAFETY FACTOR TABLE

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| S.NO. | X-CO-ORD | Y-CO-ORD | RADIUS | INT.POINT $X_1$ | INT.POINT $X_2$ | SIGMA FRICTION | SIGMA SLIDING | F.O.S | |
| 1 | 220.31 | 345.81 | 26.31 | 206.24 | 244.91 | 210.56 | 93.86 | 2.24 | |
| 2 | 222.31 | 345.81 | 26.31 | 207.56 | 247.12 | 229.28 | 107.74 | 2.13 | |
| 3 | 224.31 | 345.81 | 26.31 | 208.92 | 249.12 | 254.43 | 128.35 | 1.98 | |
| 4 | 226.31 | 345.81 | 26.31 | 210.30 | 251.12 | 276.92 | 141.46 | 1.96 | |
| 5 | 228.31 | 345.81 | 26.31 | 211.71 | 253.04 | 304.45 | 159.40 | 1.91 | |
| 6 | 230.31 | 345.81 | 26.31 | 213.14 | 254.72 | 328.84 | 167.12 | 1.97 | |
| 7 | 230.31 | 347.81 | 28.31 | 212.62 | 255.78 | 344.10 | 170.34 | 2.02 | |
| 8 | 232.31 | 347.81 | 28.31 | 214.05 | 257.38 | 365.15 | 171.19 | 2.13 | |
| 9 | 228.31 | 347.81 | 28.31 | 211.22 | 254.16 | 319.57 | 164.61 | 1.94 | |
| 10 | 226.31 | 347.81 | 28.31 | 209.84 | 252.49 | 297.78 | 154.07 | 1.93 | |
| 11 | 224.31 | 347.81 | 28.31 | 208.49 | 250.49 | 273.67 | 141.40 | 1.94 | |
| 12 | 224.31 | 343.81 | 24.31 | 209.38 | 247.66 | 233.61 | 114.54 | 2.04 | |
| 13 | 226.31 | 343.81 | 24.31 | 210.79 | 249.66 | 259.85 | 134.70 | 1.93 | |
| 14 | 228.31 | 343.81 | 24.31 | 212.23 | 251.66 | 281.75 | 146.35 | 1.93 | |
| 15 | 230.31 | 343.81 | 24.31 | 213.69 | 253.52 | 305.43 | 156.20 | 1.96 | |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| WEST BANASIRRIGATION PROJECT | | | | | | | | | |
| UPSTREAM SLOPE STABILITY ANALYSIS | | | | | | | | | |
| U/S SUDDEN DRAW DN.AT(NSL) 3. | | | | | WITHOUT EARTHQUAKE | | | | |
| | | | | | | | | | |
| POOL ELEVATION = | | | | | | 334.45 | metres | | |
| MAXIMUM DRAWDOWN LEVEL = | | | | | | 327.1 | metres | | |
| GROUND LEVEL = | | | | | | 321.5 | metres | | |
| ALL CIRCLES TOUCH AT ELEVATION = | | | | | | 321.5 | metres | | |
| ACCELERATION COEFFICIENT | | | | | | | | | |
| HORIZONTAL ACCELERATION COEFFICIENT = | | | | | | 0.00 | | | |
| VERTICAL ACCELERATION COEFFICIENT = | | | | | | 0.00 | | | |
| | | | | | | | | | |
| MINIMUM FACTOR OF SAFETY = | | | | | | 1.68 | | | |
| SAFETY FACTOR TABLE | | | | | | | | | |
| | | | | | | | | | |
| S.NO. | X-CO-ORD | Y-CO-ORD | RADIUS | INT.POINT $X_1$ | INT.POINT $X_2$ | SIGMA FRICTION | SIGMA SLIDING | F.O.S | |
| 1 | 223.31 | 344.81 | 23.31 | 210.84 | 245.10 | 190.09 | 110.87 | 1.71 | |
| 2 | 225.31 | 344.81 | 23.31 | 212.17 | 247.29 | 212.92 | 121.37 | 1.75 | |
| 3 | 221.31 | 344.81 | 23.31 | 209.55 | 242.79 | 170.43 | 100.29 | 1.70 | |
| 4 | 219.31 | 344.81 | 23.31 | 208.30 | 240.45 | 153.49 | 88.86 | 1.73 | |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 5 | 219.31 | 346.81 | 25.31 | 208.00 | 241.94 | 163.70 | 96.51 | 1.70 | |
| 6 | 221.31 | 346.81 | 25.31 | 209.22 | 244.32 | 182.69 | 108.50 | 1.68 | |
| 7 | 223.31 | 346.81 | 25.31 | 210.48 | 246.66 | 204.75 | 119.71 | 1.71 | |
| 8 | 223.31 | 348.81 | 27.31 | 210.15 | 247.95 | 219.95 | 127.93 | 1.72 | |
| 9 | 225.31 | 348.81 | 27.31 | 211.41 | 249.95 | 247.35 | 136.85 | 1.81 | |
| 10 | 221.31 | 348.81 | 27.31 | 208.92 | 245.83 | 198.00 | 115.76 | 1.71 | |
| 11 | 219.31 | 348.81 | 27.31 | 207.73 | 243.41 | 175.63 | 103.53 | 1.70 | |
| 12 | 217.31 | 348.81 | 27.31 | 206.58 | 240.96 | 156.04 | 90.92 | 1.72 | |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| WEST BANASIRRIGATION PROJECT | | | | | | | | | |
| UPSTREAM SLOPE STABILITY ANALYSIS | | | | | | | | | |
| | | | | | | | | | |
| U/S SUDDEN DRAW DN.BELOW (NSL) 4 | | | | | WITHOUT EARTHQUAKE | | | | |
| | | | | | | | | | |
| POOL ELEVATION = | | | | | | 334.45 | metres | | |
| MAXIMUM DRAWDOWN LEVEL = | | | | | | 327.1 | metres | | |
| GROUND LEVEL = | | | | | | 321.5 | metres | | |
| ALL CIRCLES TOUCH AT ELEVATION = | | | | | | 319.5 | metres | | |
| ACCELERATION COEFFICIENT | | | | | | | | | |
| HORIZONTAL ACCELERATION COEFFICIENT = | | | | | | 0.00 | | | |
| VERTICAL ACCELERATION COEFFICIENT = | | | | | | 0.00 | | | |
| | | | | | | | | | |
| MINIMUM FACTOR OF SAFETY = | | | | | | 1.55 | | | |
| SAFETY FACTOR TABLE | | | | | | | | | |
| | | | | | | | | | |
| S.NO. | X-CO-ORD | Y-CO-ORD | RADIUS | INT.POINT $X_1$ | INT.POINT $X_2$ | SIGMA FRICTION | SIGMA SLIDING | F.O.S | |
| 1 | 220.31 | 345.81 | 26.31 | 206.24 | 244.91 | 210.56 | 134.22 | 1.57 | |
| 2 | 222.31 | 345.81 | 26.31 | 207.56 | 247.12 | 229.28 | 148.24 | 1.55 | |
| 3 | 224.31 | 345.81 | 26.31 | 208.92 | 249.12 | 254.43 | 158.80 | 1.60 | |
| 4 | 224.31 | 347.81 | 28.31 | 208.49 | 250.49 | 273.67 | 168.75 | 1.62 | |
| 5 | 226.31 | 347.81 | 28.31 | 209.84 | 252.49 | 297.78 | 177.43 | 1.68 | |
| 6 | 222.31 | 347.81 | 28.31 | 207.17 | 248.49 | 246.01 | 158.82 | 1.55 | |
| 7 | 220.31 | 347.81 | 28.31 | 205.87 | 246.47 | 225.32 | 144.11 | 1.56 | |
| 8 | 220.31 | 343.81 | 24.31 | 206.63 | 243.31 | 194.79 | 125.01 | 1.56 | |
| 9 | 222.31 | 343.81 | 24.31 | 207.99 | 245.55 | 213.41 | 136.68 | 1.56 | |
| 10 | 218.31 | 343.81 | 24.31 | 205.31 | 241.04 | 179.75 | 112.96 | 1.59 | |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| WEST BANASIRRIGATION PROJECT | | | | | | | | | |
| UPSTREAM SLOPE STABILITY ANALYSIS | | | | | | | | | |
| | | | | | | | | | |
| U/S SUDDEN DRAW DN.BELOW (NSL) 4 | | | | | WITHOUT EARTHQUAKE | | | | |
| | | | | | | | | | |
| POOL ELEVATION = | | | | | | 334.45 | metres | | |
| MAXIMUM DRAWDOWN LEVEL = | | | | | | 327.1 | metres | | |
| GROUND LEVEL = | | | | | | 321.5 | metres | | |
| ALL CIRCLES TOUCH AT ELEVATION = | | | | | | 319.5 | metres | | |
| ACCELERATION COEFFICIENT | | | | | | | | | |
| HORIZONTAL ACCELERATION COEFFICIENT = | | | | | | 0.00 | | | |
| VERTICAL ACCELERATION COEFFICIENT = | | | | | | 0.00 | | | |
| | | | | | | | | | |
| MINIMUM FACTOR OF SAFETY = | | | | | | 1.55 | | | |
| SAFETY FACTOR TABLE | | | | | | | | | |
| | | | | | | | | | |
| S.NO. | X-CO-ORD | Y-CO-ORD | RADIUS | INT.POINT $X_1$ | INT.POINT $X_2$ | SIGMA FRICTION | SIGMA SLIDING | F.O.S | |
| 1 | 220.31 | 345.81 | 26.31 | 206.24 | 244.91 | 210.56 | 134.22 | 1.57 | |
| 2 | 222.31 | 345.81 | 26.31 | 207.56 | 247.12 | 229.28 | 148.24 | 1.55 | |
| 3 | 224.31 | 345.81 | 26.31 | 208.92 | 249.12 | 254.43 | 158.80 | 1.60 | |
| 4 | 224.31 | 347.81 | 28.31 | 208.49 | 250.49 | 273.67 | 168.75 | 1.62 | |
| 5 | 226.31 | 347.81 | 28.31 | 209.84 | 252.49 | 297.78 | 177.43 | 1.68 | |
| 6 | 222.31 | 347.81 | 28.31 | 207.17 | 248.49 | 246.01 | 158.82 | 1.55 | |
| 7 | 220.31 | 347.81 | 28.31 | 205.87 | 246.47 | 225.32 | 144.11 | 1.56 | |
| 8 | 220.31 | 343.81 | 24.31 | 206.63 | 243.31 | 194.79 | 125.01 | 1.56 | |
| 9 | 222.31 | 343.81 | 24.31 | 207.99 | 245.55 | 213.41 | 136.68 | 1.56 | |
| 10 | 218.31 | 343.81 | 24.31 | 205.31 | 241.04 | 179.75 | 112.96 | 1.59 | |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| WEST BANASIRRIGATION PROJECT | | | | | | | | | |
| UPSTREAM SLOPE STABILITY ANALYSIS | | | | | | | | | |
| | | | | | | | | | |
| U/S SUDDEN DRAW DN.AT(NSL) 3. | | | | | COMBINED WITH EARTHQUAKE | | | | |
| | | | | | | | | | |
| POOL ELEVATION = | | | | | | 334.45 | metres | | |
| MAXIMUM DRAWDOWN LEVEL = | | | | | | 327.1 | metres | | |
| GROUND LEVEL = | | | | | | 321.5 | metres | | |
| ALL CIRCLES TOUCH AT ELEVATION = | | | | | | 321.50 | metres | | |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| ACCELERATION COEFFICIENT | | | | | | | | | |
| HORIZONTAL ACCELERATION COEFFICIENT = | | | | | | 0.05 | | | |
| VERTICAL ACCELERATION COEFFICIENT = | | | | | | 0.03 | | | |
| | | | | | | | | | |
| MINIMUM FACTOR OF SAFETY = | | | | | | 1.37 | | | |
| SAFETY FACTOR TABLE | | | | | | | | | |
| | | | | | | | | | |
| S.NO. | X-CO-ORD | Y-CO-ORD | RADIUS | INT.POINT $X_1$ | INT.POINT $X_2$ | SIGMA FRICTION | SIGMA SLIDING | F.O.S | |
| 1 | 223.31 | 344.81 | 23.31 | 210.84 | 245.10 | 178.54 | 128.60 | 1.39 | |
| 2 | 225.31 | 344.81 | 23.31 | 212.17 | 247.29 | 200.33 | 140.97 | 1.42 | |
| 3 | 221.31 | 344.81 | 23.31 | 209.55 | 242.79 | 159.95 | 116.18 | 1.38 | |
| 4 | 219.31 | 344.81 | 23.31 | 208.30 | 240.45 | 144.10 | 102.95 | 1.40 | |
| 5 | 219.31 | 346.81 | 25.31 | 208.00 | 241.94 | 153.61 | 111.56 | 1.38 | |
| 6 | 221.31 | 346.81 | 25.31 | 209.22 | 244.32 | 171.46 | 125.44 | 1.37 | |
| 7 | 223.31 | 346.81 | 25.31 | 210.48 | 246.66 | 192.38 | 138.59 | 1.39 | |
| 8 | 223.31 | 348.81 | 27.31 | 210.15 | 247.95 | 206.81 | 147.94 | 1.40 | |
| 9 | 225.31 | 348.81 | 27.31 | 211.41 | 249.95 | 233.17 | 158.91 | 1.47 | |
| 10 | 221.31 | 348.81 | 27.31 | 208.92 | 245.83 | 186.05 | 133.74 | 1.39 | |
| 11 | 219.31 | 348.81 | 27.31 | 207.73 | 243.41 | 164.87 | 119.55 | 1.38 | |
| 12 | 217.31 | 348.81 | 27.31 | 206.58 | 240.96 | 146.48 | 105.02 | 1.39 | |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| WEST BANASIRRIGATION PROJECT | | | | | | | | | |
| DOWNSTREAM SLOPE STABILITY ANALYSIS | | | | | | | | | |
| | | | | | | | | | |
| (D/S)STEADY SEEPAGE AT (NSL) 5. | | | | | WITHOUT EARTHQUAKE | | | | |
| | | | | | | | | | |
| POOL ELEVATION = | | | | | | 334.45 | metres | | |
| TAIL WATER LEVEL = | | | | | | 320 | metres | | |
| GROUND ELEVATION = | | | | | | 321.5 | metres | | |
| ALL CIRCLES TOUCH AT ELEVATION = | | | | | | 321.5 | metres | | |
| ACCELERATION COEFFICIENT | | | | | | | | | |
| HORIZONTAL ACCELERATION COEFFICIENT = | | | | | | 0.00 | | | |
| VERTICAL ACCELERATION COEFFICIENT = | | | | | | 0.00 | | | |
| | | | | | | | | | |
| MINIMUM FACTOR OF SAFETY = | | | | | | 1.71 | | | |
| SAFETY FACTOR TABLE | | | | | | | | | |
| | | | | | | | | | |
| S.NO. | X-CO-ORD | Y-CO-ORD | RADIUS | INT.POINT $X_1$ | INT.POINT $X_2$ | SIGMA FRICTION | SIGMA SLIDING | F.O.S | |
| 1 | 249.285 | 344.81 | 23.31 | 230.12 | 267.12 | 459.00 | 24.72 | 18.57 | |
| 2 | 251.285 | 344.81 | 23.31 | 231.76 | 268.51 | 458.98 | 48.09 | 9.54 | |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 3 | 253.285 | 344.81 | 23.31 | 233.41 | 269.86 | 460.23 | 69.61 | 6.61 | |
| 4 | 255.285 | 344.81 | 23.31 | 235.08 | 271.18 | 451.52 | 90.41 | 4.99 | |
| 5 | 257.285 | 344.81 | 23.31 | 236.76 | 272.47 | 441.32 | 108.35 | 4.07 | |
| 6 | 259.285 | 344.81 | 23.31 | 238.47 | 273.71 | 423.60 | 124.56 | 3.40 | |
| 7 | 261.285 | 344.81 | 23.31 | 240.19 | 274.91 | 402.38 | 137.45 | 2.93 | |
| 8 | 263.285 | 344.81 | 23.31 | 241.93 | 276.07 | 376.83 | 147.02 | 2.56 | |
| 9 | 265.285 | 344.81 | 23.31 | 243.68 | 277.18 | 348.89 | 152.16 | 2.29 | |
| 10 | 267.285 | 344.81 | 23.31 | 245.45 | 278.24 | 318.72 | 152.12 | 2.10 | |
| 11 | 269.285 | 344.81 | 23.31 | 247.31 | 279.24 | 286.82 | 146.66 | 1.96 | |
| 12 | 271.285 | 344.81 | 23.31 | 249.31 | 280.18 | 253.71 | 136.87 | 1.85 | |
| 13 | 273.285 | 344.81 | 23.31 | 251.31 | 281.05 | 220.31 | 122.91 | 1.79 | |
| 14 | 275.285 | 344.81 | 23.31 | 253.46 | 281.83 | 186.70 | 104.73 | 1.78 | |
| 15 | 277.285 | 344.81 | 23.31 | 255.97 | 282.52 | 153.63 | 85.77 | 1.79 | |
| 16 | 277.285 | 346.81 | 25.31 | 254.31 | 282.59 | 168.62 | 95.51 | 1.77 | |
| 17 | 279.285 | 346.81 | 25.31 | 256.97 | 283.12 | 135.37 | 75.55 | 1.79 | |
| 18 | 275.285 | 346.81 | 25.31 | 251.94 | 281.93 | 203.21 | 115.73 | 1.76 | |
| 19 | 273.285 | 346.81 | 25.31 | 249.94 | 281.18 | 237.52 | 132.59 | 1.79 | |
| 20 | 273.285 | 348.81 | 27.31 | 248.64 | 281.30 | 254.28 | 140.87 | 1.81 | |
| 21 | 275.285 | 348.81 | 27.31 | 250.64 | 282.02 | 219.15 | 125.29 | 1.75 | |
| 22 | 277.285 | 348.81 | 27.31 | 252.65 | 282.65 | 184.15 | 105.65 | 1.74 | |
| 23 | 279.285 | 348.81 | 27.31 | 255.34 | 283.16 | 148.94 | 84.28 | 1.77 | |
| 24 | 279.285 | 350.81 | 29.31 | 253.71 | 283.19 | 163.07 | 93.43 | 1.75 | |
| 25 | 281.285 | 350.81 | 29.31 | 256.56 | 283.54 | 128.14 | 71.60 | 1.79 | |
| 26 | 277.285 | 350.81 | 29.31 | 251.41 | 282.70 | 199.01 | 115.34 | 1.73 | |
| 27 | 275.285 | 350.81 | 29.31 | 249.41 | 282.10 | 234.80 | 133.60 | 1.76 | |
| 28 | 275.285 | 352.81 | 31.31 | 248.24 | 282.17 | 250.08 | 140.83 | 1.78 | |
| 29 | 277.285 | 352.81 | 31.31 | 250.24 | 282.75 | 213.68 | 123.80 | 1.73 | |
| 30 | 279.285 | 352.81 | 31.31 | 252.24 | 283.21 | 177.44 | 102.97 | 1.72 | |
| 31 | 281.285 | 352.81 | 31.31 | 254.95 | 283.55 | 140.97 | 79.83 | 1.77 | |
| 32 | 281.285 | 354.81 | 33.31 | 253.34 | 283.55 | 154.37 | 88.50 | 1.74 | |
| 33 | 283.285 | 354.81 | 33.31 | 256.39 | 283.70 | 118.30 | 65.38 | 1.81 | |
| 34 | 279.285 | 354.81 | 33.31 | 251.11 | 283.24 | 191.24 | 111.69 | 1.71 | |
| 35 | 277.285 | 354.81 | 33.31 | 249.11 | 282.79 | 228.07 | 131.21 | 1.74 | |
| 36 | 277.285 | 356.81 | 35.31 | 248.03 | 282.83 | 242.16 | 137.77 | 1.76 | |
| 37 | 279.285 | 356.81 | 35.31 | 250.03 | 283.26 | 204.84 | 119.40 | 1.72 | |
| 38 | 281.285 | 356.81 | 35.31 | 252.03 | 283.56 | 167.73 | 97.42 | 1.72 | |

WEST BANASIRRIGATION PROJECT

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| DOWNSTREAM SLOPE STABILITY ANALYSIS | | | | | | | | | |
| | | | | | | | | | |
| (D/S)STEADY SEEPAGE BELOW (NSL)6 | | | | | WITHOUT EARTHQUAKE | | | | |
| | | | | | | | | | |
| POOL ELEVATION = | | | | | | 334.45 | metres | | |
| TAIL WATER LEVEL = | | | | | | 320 | metres | | |
| GROUND ELEVATION = | | | | | | 321.5 | metres | | |
| ALL CIRCLES TOUCH AT ELEVATION = | | | | | | 319.5 | metres | | |
| ACCELERATION COEFFICIENT | | | | | | | | | |
| HORIZONTAL ACCELERATION COEFFICIENT = | | | | | | 0.00 | | | |
| VERTICAL ACCELERATION COEFFICIENT = | | | | | | 0.00 | | | |
| | | | | | | | | | |
| MINIMUM FACTOR OF SAFETY = | | | | | | 1.50 | | | |
| SAFETY FACTOR TABLE | | | | | | | | | |
| | | | | | | | | | |
| S.NO. | X-CO-ORD | Y-CO-ORD | RADIUS | INT.POINT $X_1$ | INT.POINT $X_2$ | SIGMA FRICTION | SIGMA SLIDING | F.O.S | |
| 1 | 251.785 | 345.81 | 26.31 | 229.76 | 271.01 | 428.16 | 65.50 | 6.54 | |
| 2 | 253.785 | 345.81 | 26.31 | 231.41 | 272.36 | 434.67 | 90.41 | 4.81 | |
| 3 | 255.785 | 345.81 | 26.31 | 233.08 | 273.67 | 426.98 | 113.75 | 3.75 | |
| 4 | 257.785 | 345.81 | 26.31 | 234.76 | 274.96 | 420.45 | 134.99 | 3.11 | |
| 5 | 259.785 | 345.81 | 26.31 | 236.45 | 276.20 | 418.31 | 152.64 | 2.74 | |
| 6 | 261.785 | 345.81 | 26.31 | 238.17 | 277.42 | 403.70 | 168.38 | 2.40 | |
| 7 | 263.785 | 345.81 | 26.31 | 239.89 | 278.59 | 384.47 | 180.65 | 2.13 | |
| 8 | 265.785 | 345.81 | 26.31 | 241.63 | 279.72 | 367.89 | 189.23 | 1.94 | |
| 9 | 267.785 | 345.81 | 26.31 | 243.39 | 280.81 | 343.24 | 193.24 | 1.78 | |
| 10 | 269.785 | 345.81 | 26.31 | 245.16 | 281.85 | 321.44 | 192.17 | 1.67 | |
| 11 | 271.785 | 345.81 | 26.31 | 246.98 | 282.84 | 292.83 | 185.15 | 1.58 | |
| 12 | 273.785 | 345.81 | 26.31 | 248.98 | 283.77 | 267.65 | 173.70 | 1.54 | |
| 13 | 275.785 | 345.81 | 26.31 | 250.98 | 284.64 | 236.15 | 157.68 | 1.50 | |
| 14 | 277.785 | 345.81 | 26.31 | 253.06 | 285.44 | 205.62 | 136.86 | 1.50 | |
| 15 | 277.785 | 347.81 | 28.31 | 251.60 | 285.54 | 224.26 | 149.16 | 1.50 | |
| 16 | 279.785 | 347.81 | 28.31 | 253.87 | 286.22 | 192.77 | 126.36 | 1.53 | |
| 17 | 275.785 | 347.81 | 28.31 | 249.60 | 284.78 | 252.54 | 168.50 | 1.50 | |
| 18 | 273.785 | 347.81 | 28.31 | 247.60 | 283.94 | 284.52 | 183.44 | 1.55 | |
| 19 | 273.785 | 343.81 | 24.31 | 250.44 | 283.58 | 246.71 | 162.33 | 1.52 | |
| 20 | 275.785 | 343.81 | 24.31 | 252.44 | 284.49 | 219.41 | 144.95 | 1.51 | |
| 21 | 277.785 | 343.81 | 24.31 | 254.77 | 285.32 | 189.72 | 124.31 | 1.53 | |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| WEST BANASIRRIGATION PROJECT | | | | | | | | | |
| DOWNSTREAM SLOPE STABILITY ANALYSIS | | | | | | | | | |
| (D/S)STEADY SEEPAGE AT (NSL) 5. | | | | | COMBINED WITH EARTHQUAKE | | | | |
| | | | | | | | | | |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| POOL ELEVATION = | | | | | 334.45 | metres | | |
| TAIL WATER LEVEL = | | | | | 320 | metres | | |
| GROUND ELEVATION = | | | | | 321.5 | metres | | |
| ALL CIRCLES TOUCH AT ELEVATION = | | | | | 321.5 | metres | | |
| ACCELERATION COEFFICIENT | | | | | | | | |
| HORIZONTAL ACCELERATION COEFFICIENT = | | | | | 0.05 | | | |
| VERTICAL ACCELERATION COEFFICIENT = | | | | | 0.03 | | | |
| | | | | | | | | |
| MINIMUM FACTOR OF SAFETY = | | | | | 1.52 | | | |
| SAFETY FACTOR TABLE | | | | | | | | |
| | | | | | | | | |
| S.NO. | X-CO-ORD | Y-CO-ORD | RADIUS | INT.POINT $X_1$ | INT.POINT $X_2$ | SIGMA FRICTION | SIGMA SLIDING | F.O.S | |
| 1 | 249.285 | 344.81 | 23.31 | 230.12 | 267.12 | 444.65 | 60.21 | 7.39 | |
| 2 | 251.285 | 344.81 | 23.31 | 231.76 | 268.51 | 444.11 | 82.32 | 5.39 | |
| 3 | 253.285 | 344.81 | 23.31 | 233.41 | 269.86 | 445.02 | 102.29 | 4.35 | |
| 4 | 255.285 | 344.81 | 23.31 | 235.08 | 271.18 | 436.06 | 121.39 | 3.59 | |
| 5 | 257.285 | 344.81 | 23.31 | 236.76 | 272.47 | 425.82 | 137.41 | 3.10 | |
| 6 | 259.285 | 344.81 | 23.31 | 238.47 | 273.71 | 408.18 | 151.56 | 2.69 | |
| 7 | 261.285 | 344.81 | 23.31 | 240.19 | 274.91 | 387.24 | 162.25 | 2.39 | |
| 8 | 263.285 | 344.81 | 23.31 | 241.93 | 276.07 | 362.14 | 169.52 | 2.14 | |
| 9 | 265.285 | 344.81 | 23.31 | 243.68 | 277.18 | 334.87 | 172.30 | 1.94 | |
| 10 | 267.285 | 344.81 | 23.31 | 245.45 | 278.24 | 305.60 | 169.88 | 1.80 | |
| 11 | 269.285 | 344.81 | 23.31 | 247.31 | 279.24 | 274.80 | 162.10 | 1.70 | |
| 12 | 271.285 | 344.81 | 23.31 | 249.31 | 280.18 | 242.96 | 150.04 | 1.62 | |
| 13 | 273.285 | 344.81 | 23.31 | 251.31 | 281.05 | 210.96 | 133.93 | 1.58 | |
| 14 | 275.285 | 344.81 | 23.31 | 253.46 | 281.83 | 178.87 | 113.74 | 1.57 | |
| 15 | 277.285 | 344.81 | 23.31 | 255.97 | 282.52 | 147.30 | 92.92 | 1.59 | |
| 16 | 277.285 | 346.81 | 25.31 | 254.31 | 282.59 | 161.60 | 103.40 | 1.56 | |
| 17 | 279.285 | 346.81 | 25.31 | 256.97 | 283.12 | 129.88 | 81.62 | 1.59 | |
| 18 | 275.285 | 346.81 | 25.31 | 251.94 | 281.93 | 194.59 | 125.60 | 1.55 | |
| 19 | 273.285 | 346.81 | 25.31 | 249.94 | 281.18 | 227.39 | 144.59 | 1.57 | |
| 20 | 273.285 | 348.81 | 27.31 | 248.64 | 281.30 | 243.42 | 153.88 | 1.58 | |
| 21 | 275.285 | 348.81 | 27.31 | 250.64 | 282.02 | 209.79 | 136.07 | 1.54 | |
| 22 | 277.285 | 348.81 | 27.31 | 252.65 | 282.65 | 176.41 | 114.33 | 1.54 | |
| 23 | 277.285 | 350.81 | 29.31 | 251.41 | 282.70 | 190.55 | 124.83 | 1.53 | |
| 24 | 279.285 | 350.81 | 29.31 | 253.71 | 283.19 | 156.31 | 100.87 | 1.55 | |
| 25 | 275.285 | 350.81 | 29.31 | 249.41 | 282.10 | 224.74 | 145.29 | 1.55 | |
| 26 | 275.285 | 352.81 | 31.31 | 248.24 | 282.17 | 239.36 | 153.45 | 1.56 | |
| 27 | 277.285 | 352.81 | 31.31 | 250.24 | 282.75 | 204.54 | 134.13 | 1.52 | |
| 28 | 279.285 | 352.81 | 31.31 | 252.24 | 283.21 | 170.00 | 111.15 | 1.53 | |
| 29 | 279.285 | 354.81 | 33.31 | 251.11 | 283.24 | 183.14 | 120.64 | 1.52 | |
| 30 | 281.285 | 354.81 | 33.31 | 253.34 | 283.55 | 148.03 | 95.36 | 1.55 | |
| 31 | 277.285 | 354.81 | 33.31 | 249.11 | 282.79 | 218.30 | 142.40 | 1.53 | |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 32 | 277.285 | 356.81 | 35.31 | 248.03 | 282.83 | 231.79 | 149.81 | 1.55 | |
| 33 | 279.285 | 356.81 | 35.31 | 250.03 | 283.26 | 196.12 | 129.13 | 1.52 | |
| 34 | 281.285 | 356.81 | 35.31 | 252.03 | 283.56 | 160.76 | 104.98 | 1.53 | |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| WEST BANASIRRIGATION PROJECT | | | | | | | | | |
| DOWNSTREAM SLOPE STABILITY ANALYSIS | | | | | | | | | |
| | | | | | | | | | |
| (D/S)STEADY SEEPAGE BELOW (NSL)6 | | | | | COMBINED WITH EARTHQUAKE | | | | |
| | | | | | | | | | |
| POOL ELEVATION = | | | | | | 334.45 | metres | | |
| TAIL WATER LEVEL = | | | | | | 320 | metres | | |
| GROUND ELEVATION = | | | | | | 321.5 | metres | | |
| ALL CIRCLES TOUCH AT ELEVATION = | | | | | | 319.5 | metres | | |
| ACCELERATION COEFFICIENT | | | | | | | | | |
| HORIZONTAL ACCELERATION COEFFICIENT = | | | | | | 0.05 | | | |
| VERTICAL ACCELERATION COEFFICIENT = | | | | | | 0.03 | | | |
| | | | | | | | | | |
| MINIMUM FACTOR OF SAFETY = | | | | | | 1.31 | | | |
| SAFETY FACTOR TABLE | | | | | | | | | |
| | | | | | | | | | |
| S.NO. | X-CO-ORD | Y-CO-ORD | RADIUS | INT.POINT $X_1$ | INT.POINT $X_2$ | SIGMA FRICTION | SIGMA SLIDING | F.O.S | |
| 1 | 251.785 | 345.81 | 26.31 | 229.76 | 271.01 | 414.06 | 108.50 | 3.82 | |
| 2 | 253.785 | 345.81 | 26.31 | 231.41 | 272.36 | 419.80 | 131.69 | 3.19 | |
| 3 | 255.785 | 345.81 | 26.31 | 233.08 | 273.67 | 411.93 | 153.09 | 2.69 | |
| 4 | 257.785 | 345.81 | 26.31 | 234.76 | 274.96 | 405.27 | 172.20 | 2.35 | |
| 5 | 259.785 | 345.81 | 26.31 | 236.45 | 276.20 | 402.77 | 187.53 | 2.15 | |
| 6 | 261.785 | 345.81 | 26.31 | 238.17 | 277.42 | 388.30 | 200.84 | 1.93 | |
| 7 | 263.785 | 345.81 | 26.31 | 239.89 | 278.59 | 369.39 | 210.58 | 1.75 | |
| 8 | 265.785 | 345.81 | 26.31 | 241.63 | 279.72 | 352.89 | 216.53 | 1.63 | |
| 9 | 267.785 | 345.81 | 26.31 | 243.39 | 280.81 | 328.93 | 217.87 | 1.51 | |
| 10 | 269.785 | 345.81 | 26.31 | 245.16 | 281.85 | 307.70 | 214.14 | 1.44 | |
| 11 | 271.785 | 345.81 | 26.31 | 246.98 | 282.84 | 280.22 | 204.49 | 1.37 | |
| 12 | 273.785 | 345.81 | 26.31 | 248.98 | 283.77 | 256.04 | 190.49 | 1.34 | |
| 13 | 275.785 | 345.81 | 26.31 | 250.98 | 284.64 | 225.94 | 172.06 | 1.31 | |
| 14 | 277.785 | 345.81 | 26.31 | 253.06 | 285.44 | 196.91 | 149.00 | 1.32 | |
| 15 | 277.785 | 347.81 | 28.31 | 251.60 | 285.54 | 214.58 | 162.31 | 1.32 | |
| 16 | 279.785 | 347.81 | 28.31 | 253.87 | 286.22 | 184.67 | 137.32 | 1.34 | |
| 17 | 275.785 | 347.81 | 28.31 | 249.60 | 284.78 | 241.58 | 184.02 | 1.31 | |
| 18 | 273.785 | 347.81 | 28.31 | 247.60 | 283.94 | 272.19 | 201.48 | 1.35 | |
| 19 | 273.785 | 349.81 | 30.31 | 246.34 | 284.09 | 287.80 | 211.13 | 1.36 | |
| 20 | 275.785 | 349.81 | 30.31 | 248.30 | 284.90 | 260.36 | 194.63 | 1.34 | |
| 21 | 277.785 | 349.81 | 30.31 | 250.30 | 285.64 | 229.59 | 174.12 | 1.32 | |
| 22 | 279.785 | 349.81 | 30.31 | 252.30 | 286.29 | 201.47 | 150.06 | 1.34 | |

# Annex 4.1 Crop Water Requirement

## Monthly Values of ETo Using CROPWATER Programme Developed by FAO

Country: India, Station : Jodhpur, Altitude: 224 m above M.S.L.,Latitude: 26.30º (North)

Longitude: 73.02º (East)

| Month | Max. Temp. (ºC) | Min. Temp. (ºC) | Humidity (%) | Wind Speed (km/d) | Sunshine (Hours) | Solar Radiation ($MJ/m^2/d$) | ETo (mm/d) |
|---|---|---|---|---|---|---|---|
| January | 25.1 | 10 | 46.0 | 67.2 | 8.8 | 15.6 | 2.42 |
| February | 28.1 | 12 | 39.0 | 81.6 | 9.4 | 18.5 | 3.39 |
| March | 33.6 | 17 | 29.0 | 93.6 | 9.4 | 21.2 | 4.73 |
| April | 38.7 | 22 | 27.0 | 120.0 | 10.3 | 24.6 | 6.45 |
| May | 41.5 | 27 | 36.0 | 199.2 | 10.4 | 25.6 | 8.44 |
| June | 39.8 | 27 | 50.0 | 218.4 | 9.7 | 24.6 | 7.93 |
| July | 35.7 | 26 | 65.0 | 194.4 | 6.8 | 20.2 | 5.87 |
| August | 33.4 | 25 | 69.0 | 151.2 | 7.0 | 19.9 | 5.08 |
| September | 35.5 | 24 | 59.0 | 103.2 | 9.3 | 21.7 | 5.19 |
| October | 36.4 | 20 | 42.0 | 52.8 | 9.4 | 19.4 | 3.81 |
| November | 31.7 | 15 | 38.0 | 48.0 | 9.3 | 16.6 | 2.64 |
| December | 27.7 | 11 | 43.0 | 48.0 | 8.9 | 14.9 | 2.11 |
| **Average** | **33.9** | **21** | **45.3** | **114.8** | **9.1** | **20.2** | **4.84** |

## Assessment of Crop Water Requirement and Net Irrigation Value of Various Crops

| Crops | Month | ETo in | | Kc | CWR | Pre sowing Irrigation in mm | Effective Rainfall | NIR |
|---|---|---|---|---|---|---|---|---|
| | | mm/Day | mm/Month | | | | | |
| Wheat | November | 2.64 | 42.24 | 0.28 | 12 | 50 | 0 | 62 |
| | December | 2.11 | 65.41 | 0.63 | 41 | | 0 | 41 |
| | January | 2.42 | 75.02 | 1.07 | 80 | | 0 | 80 |
| | February | 3.39 | 94.92 | 1.06 | 101 | | 0 | 101 |
| | March | 4.73 | 89.87 | 0.62 | 56 | | 0 | 56 |
| | **Total** | | | | **290** | | | **340** |
| Barley | November | 2.64 | 55.44 | 0.30 | 17 | 50 | 0 | 67 |
| | December | 2.11 | 65.41 | 0.68 | 44 | | 0 | 44 |
| | January | 2.42 | 75.02 | 1.09 | 82 | | 0 | 82 |
| | February | 3.39 | 94.92 | 0.89 | 84 | | 0 | 84 |
| | March | 4.73 | 42.57 | 0.45 | 19 | | 0 | 19 |
| | **Total** | | | | **247** | | | **297** |
| Mustard | October | 3.81 | 60.96 | 0.23 | 14 | 50 | 6 | 58 |
| | November | 2.64 | 79.20 | 0.59 | 47 | | 6 | 41 |
| | December | 2.11 | 65.41 | 1.06 | 69 | | 0 | 69 |
| | January | 2.42 | 75.02 | 0.88 | 66 | | 0 | 66 |
| | February | 3.39 | 23.73 | 0.51 | 12 | | 0 | 12 |
| | **Total** | | | | **208** | | | **246** |
| Gram | October | 3.81 | 41.91 | 0.13 | 5 | 50 | 0 | 55 |
| | November | 2.64 | 79.20 | 0.63 | 50 | | 6 | 44 |
| | December | 2.11 | 65.41 | 1.09 | 71 | | 0 | 71 |
| | January | 2.42 | 75.02 | 0.78 | 59 | | 0 | 59 |
| | February | 3.39 | 40.68 | 0.43 | 17 | | 0 | 17 |
| | **Total** | | | | **203** | | | **246** |

| Crops | Month | ETo in | | Kc | CWR | Pre sowing Irrigation in mm | Effective Rainfall | NIR |
|---|---|---|---|---|---|---|---|---|
| | | mm/Day | mm/Month | | | | | |
| Cumin | November | 2.64 | 42.24 | 0.28 | 12 | 50 | 0 | 62 |
| | December | 2.11 | 65.41 | 0.67 | 44 | | 0 | 44 |
| | January | 2.42 | 75.02 | 1.10 | 83 | | 0 | 83 |
| | February | 3.39 | 94.92 | 1.01 | 96 | | 0 | 96 |
| | March | 4.73 | 66.22 | 0.64 | 42 | | 0 | 42 |
| | **Total** | | | | **276** | | | **327** |

## Monthly Requirement of Water at Field in mm

| S.No. | Month | Rabi | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Wheat | | | Mustard | | | Cumin | | | Gram | | |
| | | CU | ER | NIR | CU | ER | NIR | CU | ER | NIR | CU | ER | NIR |
| 1 | October | - | - | - | 58 | 0 | 58 | - | - | - | 55 | - | 55 |
| 2 | November | 62 | - | 62 | 41 | 0 | 41 | 62 | - | 62 | 44 | 0 | 44 |
| 3 | December | 41 | - | 41 | 69 | - | 69 | 44 | - | 44 | 71 | - | 71 |
| 4 | January | 80 | - | 80 | 66 | - | 66 | 83 | - | 83 | 59 | - | 59 |
| 5 | February | 101 | - | 101 | 12 | - | 12 | 96 | - | 96 | 17 | - | 17 |
| 6 | March | 56 | - | 56 | - | - | - | 42 | - | 42 | - | - | - |
| | Total (Delta) | 340 | 0 | 340 | 246 | 0 | 246 | 327 | 0 | 327 | 246 | 0 | 246 |

| Effective Rainfall of 5 mm & below has not been considered. | |
|---|---|
| CU - | Consumptive Use |
| ER - | Effective Rainfall |
| NIR - | Net Irrigation Requirement |

## Monthly Requirement of Water in ha-m

| S. No. | Month | Rabi | | | | |
|---|---|---|---|---|---|---|
| | | Wheat | Mustard | Cumin | Gram | Water in ha-m |
| Area Percentage | | 17% | 25% | 17% | 19% | 78% |
| 1 | April | 0 | 0 | 0 | 0 | 0 |
| 2 | May | 0 | 0 | 0 | 0 | 0 |
| 3 | June | 0 | 0 | 0 | 0 | 0 |
| 4 | July | 0 | 0 | 0 | 0 | 0 |
| 5 | August | 0 | 0 | 0 | 0 | 0 |
| 6 | September | 0 | 0 | 0 | 0 | 0 |
| 7 | October | 0 | 145 | 0 | 104.5 | 249.5 |
| 8 | November | 105.4 | 102.5 | 105.4 | 83.6 | 396.9 |
| 9 | December | 69.7 | 172.5 | 74.8 | 134.9 | 451.9 |
| 10 | January | 136 | 165 | 141.1 | 112.1 | 554.2 |
| 11 | February | 171.7 | 30 | 163.2 | 32.3 | 397.2 |
| 12 | March | 95.2 | 0 | 71.4 | 0 | 166.6 |
| | Total | | | | | 2216.3 |

# Annex 5.1 Inventory Survey Results

## Condition Assessment of Canals and Proposed Rehabilitation Works

| Name of canal | Reach (RD m) | | Existing cross-Section | Deficiencies observed | Proposed Remedial Measures |
|---|---|---|---|---|---|
| | From | To | | | |
| RMC | 37 | 1006 | Lined | Damaged lining | Repair of Lining |
| | 51 | 54 | Lined | Damaged lining | Repair of Lining |
| | 54 | 59 | Lined | Damaged lining | Repair of Lining |
| | 61 | 67 | Lined | Damaged lining | Repair of Lining |
| | 83 | 88 | Lined | Damaged lining | Repair of Lining |
| | 182 | 201 | Lined | Damaged lining | Repair of Lining |
| | 362 | 363 | Lined | Damaged lining | Repair of Lining |
| | 412 | 415 | Lined | Damaged lining | Repair of Lining |
| | 417.5 | 434 | Lined | Damaged lining | Repair of Lining |
| | 440 | 450 | Lined | Damaged lining | Repair of Lining |
| | 456 | 460 | Lined | Damaged lining | Repair of Lining |
| | 471 | 477 | Lined | Damaged lining | Repair of Lining |
| | 478.5 | 481 | Lined | Damaged lining | Repair of Lining |
| | 482 | 483 | Lined | Damaged lining | Repair of Lining |
| | 486 | 488 | Lined | Damaged lining | Repair of Lining |
| | 490 | 497 | Lined | Damaged lining | Repair of Lining |
| | 501 | 508.6 | Lined | Damaged lining | Repair of Lining |
| | 522 | 534 | Lined | Damaged lining | Repair of Lining |
| | 537 | 545 | Lined | Damaged lining | Repair of Lining |
| | 634 | 647 | Lined | Damaged lining | Repair of Lining |
| | 988 | 1002 | Lined | Damaged lining | Repair of Lining |
| | 1004 | 1030 | Lined | Damaged lining | Repair of Lining |
| | 1036 | 1052 | Lined | Damaged lining | Repair of Lining |
| LMC | 2 | 7.5 | Lined | Damaged lining | Repair of Lining |
| | 8.5 | 11 | Lined | Damaged lining | Repair of Lining |
| | 15 | 40 | Lined | Damaged lining | Repair of Lining |
| | 41 | 55 | Lined | Damaged lining | Repair of Lining |
| | 90 | 94 | Lined | Damaged lining | Repair of Lining |

| Name of canal | Reach (RD m) | | Existing cross-Section | Deficiencies observed | Proposed Remedial Measures |
|---|---|---|---|---|---|
| | From | To | | | |
| | 144 | 150 | Lined | Damaged lining | Repair of Lining |
| | 155 | 158 | Lined | Damaged lining | Repair of Lining |
| | 165 | 168.5 | Lined | Damaged lining | Repair of Lining |
| | 171 | 175 | Lined | Damaged lining | Repair of Lining |
| | 195 | 206 | Lined | Damaged lining | Repair of Lining |
| | 239 | 240 | Lined | Damaged lining | Repair of Lining |
| | 242 | 246 | Lined | Damaged lining | Repair of Lining |
| | 257 | 259 | Lined | Damaged lining | Repair of Lining |
| | 262 | 263 | Lined | Damaged lining | Repair of Lining |
| | 272 | 273.5 | Lined | Damaged lining | Repair of Lining |
| | 291 | 296.5 | Lined | Damaged lining | Repair of Lining |
| | 318 | 322 | Lined | Damaged lining | Repair of Lining |
| | 323 | 326 | Lined | Damaged lining | Repair of Lining |
| | 329 | 335 | Lined | Damaged lining | Repair of Lining |
| | 337 | 342 | Lined | Damaged lining | Repair of Lining |
| | 348 | 358 | Lined | Damaged lining | Repair of Lining |
| | 611 | 705 | Lined | Damaged lining | Repair of Lining |
| Fulabai Khera Minor | 105 | 115 | Lined | Damaged lining | Repair of Lining |
| | 360 | 365 | Lined | Damaged lining | Repair of Lining |
| | 615 | 620 | Lined | Damaged lining | Repair of Lining |
| | 635 | 642 | Lined | Damaged lining | Repair of Lining |
| | 750 | 755 | Lined | Damaged lining | Repair of Lining |
| | 815 | 840 | Lined | Damaged lining | Repair of Lining |
| | 1012 | 1024 | Lined | Damaged lining | Repair of Lining |
| | 1105 | 1124 | Lined | Damaged lining | Repair of Lining |
| | 1170 | 1200 | Lined | Damaged lining | Repair of Lining |
| | 1210 | 1220 | Lined | Damaged lining | Repair of Lining |
| | 1520 | 1700 | Lined | Damaged lining | Repair of Lining |
| | 2160 | 2163 | Lined | Damaged lining | Repair of Lining |
| Sangwara | 45 | 51 | Lined | Damaged lining | Repair of Lining |

| Name of canal | Reach (RD m) | | Existing cross-Section | Deficiencies observed | Proposed Remedial Measures |
|---|---|---|---|---|---|
| | From | To | | | |
| Minor | | | | | |
| | 65 | 75 | Lined | Damaged lining | Repair of Lining |
| | 150 | 160 | Lined | Damaged lining | Repair of Lining |
| | 270 | 275 | Lined | Damaged lining | Repair of Lining |
| | 325 | 360 | Lined | Damaged lining | Repair of Lining |
| | 450 | 540 | Lined | Damaged lining | Repair of Lining |
| | 840 | 900 | Lined | Damaged lining | Repair of Lining |
| | 960 | 970 | Lined | Damaged lining | Repair of Lining |
| | 1020 | 1200 | Lined | Damaged lining | Repair of Lining |
| | 1290 | 1350 | Lined | Damaged lining | Repair of Lining |
| | 1390 | 1440 | Lined | Damaged lining | Repair of Lining |
| | 1590 | 1600 | Lined | Damaged lining | Repair of Lining |
| | 1700 | 1980 | Lined | Damaged lining | Repair of Lining |
| | 2010 | 2040 | Lined | Damaged lining | Repair of Lining |
| | 2100 | 2160 | Lined | Damaged lining | Repair of Lining |
| | 2250 | 2430 | Lined | Damaged lining | Repair of Lining |
| | 2980 | 2990 | Lined | Damaged lining | Repair of Lining |
| | 3045 | 3060 | Lined | Damaged lining | Repair of Lining |
| | 3090 | 3180 | Lined | Damaged lining | Repair of Lining |
| | 3390 | 3400 | Lined | Damaged lining | Repair of Lining |
| Achpura Minor | 0 | 540 | Lined | Damaged lining | Repair of Lining |
| | 600 | 630 | Lined | Damaged lining | Repair of Lining |
| | 645 | 675 | Lined | Damaged lining | Repair of Lining |
| | 780 | 790 | Lined | Damaged lining | Repair of Lining |
| | 840 | 860 | Lined | Damaged lining | Repair of Lining |
| | 920 | 930 | Lined | Damaged lining | Repair of Lining |
| | 960 | 1020 | Lined | Damaged lining | Repair of Lining |
| | 1110 | 1200 | Lined | Damaged lining | Repair of Lining |
| | 1245 | 1380 | Lined | Damaged lining | Repair of Lining |
| | 1440 | 1470 | Lined | Damaged lining | Repair of Lining |

| Name of canal | Reach (RD m) | | Existing cross-Section | Deficiencies observed | Proposed Remedial Measures |
|---|---|---|---|---|---|
| | From | To | | | |
| | 1515 | 1635 | Lined | Damaged lining | Repair of Lining |
| | 1660 | 1680 | Lined | Damaged lining | Repair of Lining |
| | 1710 | 1830 | Lined | Damaged lining | Repair of Lining |
| | 1860 | 2010 | Lined | Damaged lining | Repair of Lining |
| | 2250 | 2430 | Lined | Damaged lining | Repair of Lining |
| | 2625 | 2870 | Lined | Damaged lining | Repair of Lining |
| | 2930 | 3110 | Lined | Damaged lining | Repair of Lining |
| Mungthala Minor | 122 | 390 | Lined | Damaged lining | Repair of Lining |
| | 435 | 840 | Lined | Damaged lining | Repair of Lining |
| Kyaria Minor | 15 | 290 | Lined | Damaged lining | Repair of Lining |
| | 1150 | 1400 | Lined | Damaged lining | Repair of Lining |
| | 2400 | 2800 | Lined | Damaged lining | Repair of Lining |

## Inventory of structures

List of Structures of West Banas Project on canals

List of Structures of West Banas Project on canals

| NAME OF CANAL | FALL | SYPHON | AQUADUCT | VRB | HIGHWAY CROSSING | OUTLET | | REMARK |
|---|---|---|---|---|---|---|---|---|
| | | | | | | A | B | |
| RMC | 37 | 10 | 25 | 46 | 1 | 118 | 20 | |
| LMC | 19 | 17 | 15 | 19 | 7 | 67 | 65 | |
| Minors | | | | | | | | |
| Phulabai khera | 9 | 4 | - | 4 | - | 8 | 17 | |
| Sangwara | 5 | - | - | - | - | 16 | 26 | |
| Achpura | 11 | 5 | - | 2 | - | 8 | 5 | |
| Mungthala | 6 | 2 | 2 | 3 | - | 11 | 20 | |
| Kyaria | 2 | 3 | 2 | 2 | - | 8 | 39 | |
| **Total** | **89** | **41** | **44** | **76** | **8** | **236** | **192** | |

| INVENTRY OF STRUCTURES OF LMC CANAL | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| S. No. | FALL | FALL DEPTH | SYPHON | | AQUADUCT | | VRB | HIGHWAY CROSSING | |
| | | | FROM | TO | FROM | TO | | FROM | TO |
| 1 | 3977 | 1.2 | 310.57 | 338.52 | 2877 | 2888 | 26.913 | 2620 | 2660 |
| 2 | 6507 | 0.5 | 1216 | 1242 | 4994 | 4506 | 619.225 | 3153 | 3260 |
| 3 | 8307 | 1.36 | 3150 | 3460.5 | 5431 | 5441 | 1828.5 | 4360 | 4446 |
| 4 | 8672 | 1 | 3523 | 3553.5 | 5556 | 5565 | 2006 | 7471 | 7506 |
| 5 | 9618 | 1 | 6070 | 6086 | 7650 | 7663 | 2131 | 12451 | 12473 |
| 6 | 9862 | 1.2 | 6601 | 6610 | 8714 | 8722 | 2321 | 18752 | 18781 |
| 7 | 12584 | 1.5 | 9402 | 9412 | 8982 | 8998 | 2813 | 21492 | - |
| 8 | 12690 | 2.5 | 13583 | 13590 | 10202 | 10211 | 3203 | - | - |

| INVENTRY OF STRUCTURES OF LMC CANAL | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| S. No. | FALL | FALL DEPTH | SYPHON | | AQUADUCT | | VRB | HIGHWAY CROSSING | |
| | | | FROM | TO | FROM | TO | | FROM | TO |
| 9 | 12750 | 1.8 | 13871 | 13879 | 10774 | 10783 | 3620.5 | - | - |
| 10 | 13063 | 1.3 | 14634 | 14643 | 13372 | 13382 | 5770 | - | - |
| 11 | 13190 | 1.1 | 16302 | 16309 | 13451 | 13464 | 6684 | - | - |
| 12 | 13500 | 1 | 18161 | 18171 | 14300 | 14313 | 9573 | - | - |
| 13 | 17285 | 1.1 | 19458 | 19464 | 15285 | 15292 | 1157 | - | - |
| 14 | 17330 | 1 | 19585 | 19591 | 15550 | 15558 | 12870 | - | - |
| 15 | 17484 | 1.8 | 19860 | 19866 | 16040 | 16050 | 13274 | - | - |
| 16 | 17510 | 1.2 | 20094 | 20100 | - | - | 14537 | - | - |
| 17 | 18469 | 1.2 | 20725 | 20734 | - | - | 16602 | - | - |
| 18 | 18609 | 1.1 | - | - | - | - | 19383 | - | - |
| 19 | 18984 | 1 | - | - | - | - | - | - | - |

INVENTRY OF STRUCTURES OF RMC CANAL

| **SR NO** | **FALL** | **FALL** | **SYPHON** | | **AQUADUCT** | | **VRB** | **HIGHWAY CROSSING** | |
|---|---|---|---|---|---|---|---|---|---|
| | | **DEPTH** | **FROM** | **TO** | **FROM** | **TO** | | **FROM** | **TO** |
| 1 | 6218 | 1 | 1272 | 1413 | 2570 | 2590 | 594 | 24210 | 24220 |
| 2 | 7350 | 0.8 | 17958 | 17971 | 3554 | 3658 | 826 | - | - |
| 3 | 9600 | 1.2 | 19714 | | 4200 | 4213 | 2811 | - | - |
| 4 | 13842 | 1.2 | 19682 | 19722 | 4430 | 4447 | 3464 | - | - |
| 5 | 13982 | 1.5 | 19908 | 19926 | 4646 | 4655 | 3953 | - | - |
| 6 | 14078 | 1.5 | 23480 | 23491 | 4805 | 4816 | 4388 | - | - |
| 7 | 14247 | 2.5 | 24987 | 24997 | 5610 | 5619 | 4463 | - | - |
| 8 | 14484 | 1.8 | 25312 | 25320 | 6053 | 6064 | 5728 | - | - |
| 9 | 14684 | 1.5 | 30028 | 30043 | 6202 | 6212 | 5775 | - | - |
| 10 | 15330 | 1.5 | 32735 | 32742 | 8621 | 8635 | 6414 | - | - |
| 11 | 18804 | 1.5 | - | - | 9833 | 9844 | 7815 | - | - |
| 12 | 20042 | 1.3 | - | - | 10305 | 10329 | 8284 | - | - |
| 13 | 20206 | 2 | - | - | 11267 | 11477 | 8853 | - | - |
| 14 | 24191 | 1 | - | - | 11635 | 11647 | 10200 | - | - |
| 15 | 24568 | 1.5 | - | - | 12287 | 12298 | 10655 | - | - |
| 16 | 24778 | 1 | - | - | 12880 | 12889 | 11611 | - | - |
| 17 | 24988 | 1.5 | - | - | 15703 | 15781 | 14244 | - | - |
| 18 | 25884 | 1 | - | - | 16201 | 16244 | 15771 | - | - |
| 19 | 26195 | 1.5 | - | - | 16507 | 16530 | 16792 | - | - |
| 20 | 26314 | 1.2 | - | - | 19252 | 19340 | 17433 | - | - |
| 21 | 26400 | 1.2 | - | - | 20510 | 20520 | 18722 | - | - |
| 22 | 26764 | 1 | - | - | 20736 | 20745 | 20320 | - | - |
| 23 | 26932 | 1 | - | - | 24210 | 24220 | 21205 | - | - |
| 24 | 29400 | 0.6 | - | - | 27190 | 27209 | 21875 | - | - |
| 25 | 29575 | 0.9 | - | - | 28151 | 28173 | 22343 | - | - |
| 26 | 30817 | 1.5 | - | - | - | - | 23570 | - | - |
| 27 | 30950 | 1 | - | - | - | - | 23640 | - | - |

| SR NO | FALL | FALL | SYPHON | | AQUADUCT | | VRB | HIGHWAY CROSSING | |
|---|---|---|---|---|---|---|---|---|---|
| | | DEPTH | FROM | TO | FROM | TO | | FROM | TO |
| 28 | 31089 | 1 | - | - | - | - | 23755 | - | - |
| 29 | 31200 | 1 | - | - | - | - | 23965 | - | - |
| 30 | 31394 | 1 | - | - | - | - | 24240 | - | - |
| 31 | 31577 | 1 | - | - | - | - | 24291 | - | - |
| 32 | 31640 | 1 | - | - | - | - | 24471 | - | - |
| 33 | 31700 | 0.6 | - | - | - | - | 24564 | - | - |
| 34 | 32065 | 1 | - | - | - | - | 24687 | - | - |
| 35 | 32536 | 1 | - | - | - | - | 24725 | - | - |
| 36 | 32832 | 1 | - | - | - | - | 24875 | - | - |
| 37 | 33142 | 1 | - | - | - | - | 25120 | - | - |
| 38 | - | - | - | - | - | - | 25646 | - | - |
| 39 | - | - | - | - | - | - | 25825 | - | - |
| 40 | - | - | - | - | - | - | 26126 | - | - |
| 41 | - | - | - | - | - | - | 27161 | - | - |
| 42 | - | - | - | - | - | - | 28603 | - | - |
| 43 | - | - | - | - | - | - | 29336 | - | - |
| 44 | - | - | - | - | - | - | 29590 | - | - |
| 45 | - | - | - | - | - | - | 33464 | - | - |
| 46 | - | - | - | - | - | - | 33824 | - | - |

## List of Authorized Outlets

| S. No | Name of canal | Location (RD in m) L/R | Present status | Remarks |
|---|---|---|---|---|
| 1 | LMC | 91R | Damaged | APM is proposed |
| 2 | LMC | 823R | Damaged | APM is proposed |
| 3 | LMC | 1524R | Damaged | APM is proposed |
| 4 | LMC | 1713R | Damaged | APM is proposed |
| 5 | LMC | 2804R | Damaged | APM is proposed |
| 6 | LMC | 3078R | Damaged | APM is proposed |
| 7 | LMC | 3658R | Damaged | APM is proposed |
| 8 | LMC | 3962R | Damaged | APM is proposed |
| 9 | LMC | 4206R | Damaged | APM is proposed |
| 10 | LMC | 4481R | Damaged | APM is proposed |
| 11 | LMC | 4633R | Damaged | APM is proposed |
| 12 | LMC | 4938R | Damaged | APM is proposed |
| 13 | LMC | 5151R | Damaged | APM is proposed |
| 14 | LMC | 5212R | Damaged | APM is proposed |
| 15 | LMC | 5273R | Damaged | APM is proposed |
| 16 | LMC | 5852R | Damaged | APM is proposed |
| 17 | LMC | 6431R | Damaged | APM is proposed |
| 18 | LMC | 6492R | Damaged | APM is proposed |
| 19 | LMC | 6736R | Damaged | APM is proposed |
| 20 | LMC | 6949R | Damaged | APM is proposed |
| 21 | LMC | 7132R | Damaged | APM is proposed |
| 22 | LMC | 7407R | Damaged | APM is proposed |
| 23 | LMC | 7858R | Damaged | APM is proposed |
| 24 | LMC | 7894R | Damaged | APM is proposed |
| 25 | LMC | 8291R | Damaged | APM is proposed |
| 26 | LMC | 9114R | Damaged | APM is proposed |
| 27 | LMC | 9205R | Damaged | APM is proposed |
| 28 | LMC | 9510R | Damaged | APM is proposed |
| 29 | LMC | 9632R | Damaged | APM is proposed |
| 30 | LMC | 10577R | Damaged | APM is proposed |

| | | | | |
|---|---|---|---|---|
| 31 | LMC | 10912R | Damaged | APM is proposed |
| 32 | LMC | 11339L | Damaged | APM is proposed |
| 33 | LMC | 12619L | Damaged | APM is proposed |
| 34 | LMC | 13015R | Damaged | APM is proposed |
| 35 | LMC | 13381R | Damaged | APM is proposed |
| 36 | LMC | 13564R | Damaged | APM is proposed |
| 37 | LMC | 13716R | Damaged | APM is proposed |
| 38 | LMC | 13899R | Damaged | APM is proposed |
| 39 | LMC | 14600R | Damaged | APM is proposed |
| 40 | LMC | 14935R | Damaged | APM is proposed |
| 41 | LMC | 15179R | Damaged | APM is proposed |
| 42 | LMC | 15392R | Damaged | APM is proposed |
| 43 | LMC | 15697R | Damaged | APM is proposed |
| 44 | LMC | 15789R | Damaged | APM is proposed |
| 45 | LMC | 16307R | Damaged | APM is proposed |
| 46 | LMC | 16916R | Damaged | APM is proposed |
| 47 | LMC | 16947L | Damaged | APM is proposed |
| 48 | LMC | 16977R | Damaged | APM is proposed |
| 49 | LMC | 17008L | Damaged | APM is proposed |
| 50 | LMC | 17009L | Damaged | APM is proposed |
| 51 | LMC | 17435L | Damaged | APM is proposed |
| 52 | LMC | 17983R | Damaged | APM is proposed |
| 53 | LMC | 18286R | Damaged | APM is proposed |
| 54 | LMC | 18288R | Damaged | APM is proposed |
| 55 | LMC | 18471R | Damaged | APM is proposed |
| 56 | LMC | 18532R | Damaged | APM is proposed |
| 57 | LMC | 18867R | Damaged | APM is proposed |
| 58 | LMC | 18959R | Damaged | APM is proposed |
| 59 | LMC | 20117R | Damaged | APM is proposed |
| 60 | LMC | 20300R | Damaged | APM is proposed |
| 61 | LMC | 21031L | Damaged | APM is proposed |
| 62 | LMC | 21031R | Damaged | APM is proposed |
| 63 | LMC | 21092L | Damaged | APM is proposed |
| 64 | LMC | 21488R | Damaged | APM is proposed |
| 65 | LMC | 21610L | Damaged | APM is proposed |
| 66 | LMC | 21610R | Damaged | APM is proposed |
| 67 | LMC | 22310R | Damaged | APM is proposed |
| 68 | RMC | 305L | Damaged | APM is proposed |
| 69 | RMC | 732L | Damaged | APM is proposed |
| 70 | RMC | 1036L | Damaged | APM is proposed |
| 71 | RMC | 1158L | Damaged | APM is proposed |
| 72 | RMC | 1768L | Damaged | APM is proposed |
| 73 | RMC | 1890L | Damaged | APM is proposed |
| 74 | RMC | 2408L | Damaged | APM is proposed |
| 75 | RMC | 2743L | Damaged | APM is proposed |
| 76 | RMC | 3018L | Damaged | APM is proposed |
| 77 | RMC | 3200L | Damaged | APM is proposed |
| 78 | RMC | 3566L | Damaged | APM is proposed |
| 79 | RMC | 3581L | Damaged | APM is proposed |
| 80 | RMC | 4115L | Damaged | APM is proposed |
| 81 | RMC | 4633L | Damaged | APM is proposed |
| 82 | RMC | 4616L | Damaged | APM is proposed |
| 83 | RMC | 5029L | Damaged | APM is proposed |
| 84 | RMC | 5334L | Damaged | APM is proposed |
| 85 | RMC | 5456L | Damaged | APM is proposed |
| 86 | RMC | 6340L | Damaged | APM is proposed |
| 87 | RMC | 6527L | Damaged | APM is proposed |
| 88 | RMC | 6527L | Damaged | APM is proposed |
| 89 | RMC | 6705L | Damaged | APM is proposed |
| 90 | RMC | 7041L | Damaged | APM is proposed |
| 91 | RMC | 7620L | Damaged | APM is proposed |
| 92 | RMC | 7620R | Damaged | APM is proposed |

| | | | | |
|---|---|---|---|---|
| 93 | RMC | 7925L | Damaged | APM is proposed |
| 94 | RMC | 8382L | Damaged | APM is proposed |
| 95 | RMC | 8835L | Damaged | APM is proposed |
| 96 | RMC | 10423L | Damaged | APM is proposed |
| 97 | RMC | 10729L | Damaged | APM is proposed |
| 98 | RMC | 11887L | Damaged | APM is proposed |
| 99 | RMC | 12192L | Damaged | APM is proposed |
| 100 | RMC | 12649L | Damaged | APM is proposed |
| 101 | RMC | 12832L | Damaged | APM is proposed |
| 102 | RMC | 13255L | Damaged | APM is proposed |
| 103 | RMC | 13411L | Damaged | APM is proposed |
| 104 | RMC | 13564L | Damaged | APM is proposed |
| 105 | RMC | 13716L | Damaged | APM is proposed |
| 106 | RMC | 13811L | Damaged | APM is proposed |
| 107 | RMC | 13899L | Damaged | APM is proposed |
| 108 | RMC | 15514L | Damaged | APM is proposed |
| 109 | RMC | 15972L | Damaged | APM is proposed |
| 110 | RMC | 16714L | Damaged | APM is proposed |
| 111 | RMC | 17526L | Damaged | APM is proposed |
| 112 | RMC | 17831L | Damaged | APM is proposed |
| 113 | RMC | 18562L | Damaged | APM is proposed |
| 114 | RMC | 18806L | Damaged | APM is proposed |
| 115 | RMC | 19507L | Damaged | APM is proposed |
| 116 | RMC | 19903L | Damaged | APM is proposed |
| 117 | RMC | 20025L | Damaged | APM is proposed |
| 118 | RMC | 20157L | Damaged | APM is proposed |
| 119 | RMC | 20269L | Damaged | APM is proposed |
| 120 | RMC | 20483L | Damaged | APM is proposed |
| 121 | RMC | 20879L | Damaged | APM is proposed |
| 122 | RMC | 20031L | Damaged | APM is proposed |
| 123 | RMC | 21306L | Damaged | APM is proposed |
| 124 | RMC | 21763L | Damaged | APM is proposed |
| 125 | RMC | 21793R | Damaged | APM is proposed |
| 126 | RMC | 21793L | Damaged | APM is proposed |
| 127 | RMC | 22311L | Damaged | APM is proposed |
| 128 | RMC | 22616L | Damaged | APM is proposed |
| 129 | RMC | 23043L | Damaged | APM is proposed |
| 130 | RMC | 23165L | Damaged | APM is proposed |
| 131 | RMC | 23531L | Damaged | APM is proposed |
| 132 | RMC | 23927L | Damaged | APM is proposed |
| 133 | RMC | 24232L | Damaged | APM is proposed |
| 134 | RMC | 24541L | Damaged | APM is proposed |
| 135 | RMC | 25146L | Damaged | APM is proposed |
| 136 | RMC | 25451L | Damaged | APM is proposed |
| 137 | RMC | 25908L | Damaged | APM is proposed |
| 138 | RMC | 26426R | Damaged | APM is proposed |
| 139 | RMC | 26426L | Damaged | APM is proposed |
| 140 | RMC | 26670L | Damaged | APM is proposed |
| 141 | RMC | 26792L | Damaged | APM is proposed |
| 142 | RMC | 26792R | Damaged | APM is proposed |
| 143 | RMC | 27188L | Damaged | APM is proposed |
| 144 | RMC | 27432L | Damaged | APM is proposed |
| 145 | RMC | 27432R | Damaged | APM is proposed |
| 146 | RMC | 27554L | Damaged | APM is proposed |
| 147 | RMC | 27798L | Damaged | APM is proposed |
| 148 | RMC | 27951L | Damaged | APM is proposed |
| 149 | RMC | 28529L | Damaged | APM is proposed |
| 150 | RMC | 28651L | Damaged | APM is proposed |
| 151 | RMC | 29413L | Damaged | APM is proposed |
| 152 | RMC | 29505L | Damaged | APM is proposed |
| 153 | RMC | 29505R | Damaged | APM is proposed |
| 154 | RMC | 29870L | Damaged | APM is proposed |
| 155 | RMC | 29870R | Damaged | APM is proposed |

| | | | | |
|---|---|---|---|---|
| 156 | RMC | 29870L | Damaged | APM is proposed |
| 157 | RMC | 30236L | Damaged | APM is proposed |
| 157 | RMC | 30359L | Damaged | APM is proposed |
| 159 | RMC | 30359R | Damaged | APM is proposed |
| 160 | RMC | 30686L | Damaged | APM is proposed |
| 161 | RMC | 30541L | Damaged | APM is proposed |
| 162 | RMC | 30541R | Damaged | APM is proposed |
| 163 | RMC | 30502L | Damaged | APM is proposed |
| 164 | RMC | 30632L | Damaged | APM is proposed |
| 165 | RMC | 30693L | Damaged | APM is proposed |
| 166 | RMC | 30886L | Damaged | APM is proposed |
| 167 | RMC | 30958L | Damaged | APM is proposed |
| 168 | RMC | 30958R | Damaged | APM is proposed |
| 169 | RMC | 31090L | Damaged | APM is proposed |
| 170 | RMC | 31151L | Damaged | APM is proposed |
| 171 | RMC | 31151R | Damaged | APM is proposed |
| 172 | RMC | 31242R | Damaged | APM is proposed |
| 173 | RMC | 31242L | Damaged | APM is proposed |
| 174 | RMC | 31547L | Damaged | APM is proposed |
| 175 | RMC | 31699L | Damaged | APM is proposed |
| 176 | RMC | 31791L | Damaged | APM is proposed |
| 177 | RMC | 32306L | Damaged | APM is proposed |
| 178 | RMC | 32461L | Damaged | APM is proposed |
| 179 | RMC | 32705L | Damaged | APM is proposed |
| 180 | RMC | 32916L | Damaged | APM is proposed |
| 181 | RMC | 33223L | Damaged | APM is proposed |
| 182 | RMC | 33223L | Damaged | APM is proposed |
| 183 | RMC | 33680L | Damaged | APM is proposed |
| 184 | RMC | 33833L | Damaged | APM is proposed |
| 185 | RMC | 34741L | Damaged | APM is proposed |
| 186 | Fulabai Khera Minor | 750L | Damaged | APM is proposed |
| 187 | | 900R | Damaged | APM is proposed |
| 188 | | 1560L | Damaged | APM is proposed |
| 189 | | 1620R | Damaged | APM is proposed |
| 190 | | 1800L | Damaged | APM is proposed |
| 191 | | 1800R | Damaged | APM is proposed |
| 192 | | 1950R | Damaged | APM is proposed |
| 193 | | 2340Tail | Damaged | APM is proposed |
| 194 | Sangwara Minor | 90L | Damaged | APM is proposed |
| 195 | | 90R | Damaged | APM is proposed |
| 196 | | 300L | Damaged | APM is proposed |
| 197 | | 300R | Damaged | APM is proposed |
| 198 | | 600L | Damaged | APM is proposed |
| 199 | | 750R | Damaged | APM is proposed |
| 200 | | 960L | Damaged | APM is proposed |
| 201 | | 1170R | Damaged | APM is proposed |
| 202 | | 1230L | Damaged | APM is proposed |
| 203 | | 1320L | Damaged | APM is proposed |
| 204 | | 1620L | Damaged | APM is proposed |
| 205 | | 1770R | Damaged | APM is proposed |
| 206 | | 1800L | Damaged | APM is proposed |
| 207 | | 2550L | Damaged | APM is proposed |
| 208 | | 2550R | Damaged | APM is proposed |
| 209 | | 3750Tail | Damaged | APM is proposed |
| 210 | Achpura Minor | 300R | Damaged | APM is proposed |
| 211 | | 450L | Damaged | APM is proposed |
| 212 | | 930R | Damaged | APM is proposed |
| 213 | | 1830R | Damaged | APM is proposed |
| 214 | | 2670L | Damaged | APM is proposed |
| 215 | | 2670R | Damaged | APM is proposed |
| 216 | | 3300R | Damaged | APM is proposed |
| 217 | | 3840Tail | Damaged | APM is proposed |

| | | | | |
|---|---|---|---|---|
| 218 | Mungthala Minor | 450R | Damaged | APM is proposed |
| 219 | | 1020L | Damaged | APM is proposed |
| 220 | | 1500L | Damaged | APM is proposed |
| 221 | | 1980L | Damaged | APM is proposed |
| 222 | | 2340L | Damaged | APM is proposed |
| 223 | | 2580L | Damaged | APM is proposed |
| 224 | | 2280R | Damaged | APM is proposed |
| 225 | | 2880L | Damaged | APM is proposed |
| 226 | | 3510R | Damaged | APM is proposed |
| 227 | | 4395L | Damaged | APM is proposed |
| 228 | | 4890R | Damaged | APM is proposed |
| 229 | Kyaria Minor | 750L | Damaged | APM is proposed |
| 230 | | 735L | Damaged | APM is proposed |
| 231 | | 735R | Damaged | APM is proposed |
| 232 | | 1410L | Damaged | APM is proposed |
| 233 | | 1410R | Damaged | APM is proposed |
| 234 | | 1800L | Damaged | APM is proposed |
| 235 | | 2160R | Damaged | APM is proposed |
| 236 | | 2910L | Damaged | APM is proposed |

## List of Unauthorized Outlets

| S. No | Name of canal | Location (RD in m) L/R | Present status | Remarks |
|---|---|---|---|---|
| 1 | LMC | 0 | | |
| 2 | | 91R | | |
| 3 | | 1524R | | |
| 4 | | 1713R | | |
| 5 | | 2804R | | |
| 6 | | 3078R | | |
| 7 | | 3658R | | |
| 8 | | 3962R | | |
| 9 | | 4206R | | |
| 10 | | 4481R | | |
| 11 | | 4633R | | |
| 12 | | 4938R | | |
| 13 | | 5151R | | |
| 14 | | 5212R | | |
| 15 | | 5273R | | |
| 16 | | 5852R | | |
| 17 | | 6431R | | |
| 18 | | 6492R | | |
| 19 | | 6736R | | |
| 20 | | 6949R | | |
| 21 | | 7132R | | |
| 22 | | 7407R | | |
| 23 | | 7858R | | |
| 24 | | 7894R | | |
| 25 | | 8291R | | |
| 26 | | 9114R | | |
| 27 | | 9205R | | |
| 28 | | 9510R | | |
| 29 | | 9632R | | |
| 30 | | 10577R | | |
| 31 | | 10912R | | |
| 32 | | 11339R | | |
| 33 | | 12619R | | |
| 34 | | 13015R | | |
| 35 | | 13381R | | |
| 36 | | 13564R | | |
| 37 | | 13716R | | |
| 38 | | 13899R | | |
| 39 | | 14600R | | |
| 40 | | 14935R | | |

| | | | | |
|---|---|---|---|---|
| 41 | | 15179R | | |
| 42 | | 15392R | | |
| 43 | | 15697R | | |
| 44 | | 15789R | | |
| 45 | | 16307R | | |
| 46 | | 16916L | | |
| 47 | | 16947R | | |
| 48 | | 16977L | | |
| 49 | | 17008L | | |
| 50 | | 17009L | | |
| 51 | | 17435R | | |
| 52 | | 17983R | | |
| 53 | | 18286R | | |
| 54 | | 18288R | | |
| 55 | | 18471R | | |
| 56 | | 18532R | | |
| 57 | | 18867R | | |
| 58 | | 18959R | | |
| 59 | | 20117R | | |
| 60 | | 20300L | | |
| 61 | | 21031R | | |
| 62 | | 21031L | | |
| 63 | | 21092R | | |
| 64 | | 21488L | | |
| 65 | | 823 R | | |
| 66 | RMC | 6218L | | |
| 67 | | 7467R | | |
| 68 | | 7952R | | |
| 69 | | 12618R | | |
| 70 | | 13624R | | |
| 71 | | 13868R | | |
| 72 | | 16002R | | |
| 73 | | 16733R | | |
| 74 | | 17190R | | |
| 75 | | 17495R | | |
| 76 | | 17891R | | |
| 77 | | 18440R | | |
| 78 | | 18623R | | |
| 79 | | 19873R | | |
| 80 | | 20147R | | |
| 81 | | 20574R | | |
| 82 | | 21275R | | |
| 83 | | 23103R | | |
| 84 | | 24202 R | | |
| 85 | | 27103 R | | |
| 86 | Fulabai Khera Minor | 62L | | |
| 87 | | 72L | | |
| 88 | | 75R | | |
| 89 | | 87L | | |
| 90 | | 95L | | |
| 91 | | 180L | | |
| 92 | | 240L | | |
| 93 | | 360R | | |
| 94 | | 680L | | |
| 95 | | 820L | | |
| 96 | | 1235L | | |
| 97 | | 1730R | | |
| 98 | | 1825L | | |
| 99 | | 1920L | | |
| 100 | | 2015L | | |
| 101 | | 2230R | | |
| 102 | | 50L | | |
| 103 | Sangwara Minor | 30L | | |

| | | | | |
|---|---|---|---|---|
| 104 | | 39L | | |
| 105 | | 56L | | |
| 106 | | 64L | | |
| 107 | | 78R | | |
| 108 | | 110R | | |
| 109 | | 135L | | |
| 110 | | 191L | | |
| 111 | | 229L | | |
| 112 | | 350L | | |
| 113 | | 464R | | |
| 114 | | 569L | | |
| 115 | | 713L | | |
| 116 | | 820R | | |
| 117 | | 1190L | | |
| 118 | | 1250L | | |
| 119 | | 1420L | | |
| 120 | | 1750R | | |
| 121 | | 1780L | | |
| 122 | | 1920L | | |
| 123 | | 2050L | | |
| 124 | | 2120L | | |
| 125 | | 2250L | | |
| 126 | | 2280R | | |
| 127 | | 2320L | | |
| 128 | | 2810L | | |
| 129 | Achpura Minor | 120R | | |
| 130 | | 250R | | |
| 131 | | 600R | | |
| 132 | | 750R | | |
| 133 | | 1500R | | |
| 134 | Mungthala Minor | 20R | | |
| 135 | | 100R | | |
| 136 | | 180R | | |
| 137 | | 250R | | |
| 138 | | 380R | | |
| 139 | | 490L | | |
| 140 | | 530L | | |
| 141 | | 650L | | |
| 142 | | 720L | | |
| 143 | | 790L | | |
| 144 | | 880L | | |
| 145 | | 920R | | |
| 146 | | 1020R | | |
| 147 | | 1140R | | |
| 148 | | 1260R | | |
| 149 | | 1330R | | |
| 150 | | 1390L | | |
| 151 | | 1450R | | |
| 152 | | 1620R | | |
| 153 | | 1780R | | |
| 154 | Kyaria Minor | 30L | | |
| 155 | | 45L | | |
| 156 | | 60L | | |
| 157 | | 150L | | |
| 158 | | 210L | | |
| 159 | | 290L | | |
| 160 | | 345L | | |
| 161 | | 450L | | |
| 162 | | 555L | | |
| 163 | | 650R | | |
| 164 | | 835L | | |
| 165 | | 870R | | |
| 166 | | 990R | | |

| | | | | |
|---|---|---|---|---|
| 167 | | 1230L | | |
| 168 | | 1410L | | |
| 169 | | 1440L | | |
| 170 | | 1530R | | |
| 171 | | 1580L | | |
| 172 | | 1620L | | |
| 173 | | 1700R | | |
| 174 | | 1810L | | |
| 175 | | 1850L | | |
| 176 | | 1920R | | |
| 177 | | 1950L | | |
| 178 | | 1970R | | |
| 179 | | 2000L | | |
| 180 | | 2020L | | |
| 181 | | 2050R | | |
| 182 | | 2075L | | |
| 183 | | 2090R | | |
| 184 | | 2120L | | |
| 185 | | 2150L | | |
| 186 | | 2180R | | |
| 187 | | 2220R | | |
| 188 | | 2250L | | |
| 189 | | 2270L | | |
| 190 | | 2280R | | |
| 191 | | 2320R | | |
| 192 | | 2340R | | |

## Annex 5.2 Hydraulic Calculation and Profiles for Main and Minor Canals

xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
*(Please attach FINAL version of hydraulic calculation and profiles for all main and minor canals)*

## Annex 9.1: Cropping Areas - with/without Rehabilitation

### Cropping Areas - Without-Rehabilitation (Average)

| No. | Crop | Average Cropping Area | | | | | |
|---|---|---|---|---|---|---|---|
| | | Irrigated | | Unirrigated | | Total | |
| | | % CCA | Area [ha] | % CCA | Area [ha] | % CCA | Area [ha] |
| | **Kharif** | | | | | | |
| 1 | Maize | | 0 | | 0 | 0.0 | 0 |
| 2 | Jowar | | 0 | | 0 | 0.0 | 0 |
| 3 | Bajra | | 0 | | 0 | 0.0 | 0 |
| 4 | Kh.Pulses/Others | | 0 | | 0 | 0.0 | 0 |
| 5 | Til | | 0 | | 0 | 0.0 | 0 |
| 6 | Groundnuts | | 0 | | 0 | 0.0 | 0 |
| 7 | Cotton | | 0 | | 0 | 0.0 | 0 |
| | Total Kharif | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 |
| | **Rabi** | | | | | | |
| 1 | Wheat | | 0 | | 0 | 0.0 | 0 |
| 2 | Barley | | 0 | | 0 | 0.0 | 0 |
| 3 | Gram | | 0 | | 0 | 0.0 | 0 |
| 4 | Mustard | | 0 | | 0 | 0.0 | 0 |
| 5 | Others | | 0 | | 0 | 0.0 | 0 |
| | Total Rabi | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 |
| | | | | | | | |
| | **Grand Total** | **0.0** | **0** | **0.0** | **0** | **0.0** | **0** |

CCA = ha

### Cropping Areas - With-Rehabilitation (Average)

| No. | Crop | Average Cropping Area | | | | | |
|---|---|---|---|---|---|---|---|
| | | Irrigated | | Unirrigated | | Total | |
| | | % CCA | Area [ha] | % CCA | Area [ha] | % CCA | Area [ha] |
| | **Kharif** | | | | | | |
| 1 | Maize | | 0 | | 0 | 0.0 | 0 |
| 2 | Jowar | | 0 | | 0 | 0.0 | 0 |
| 3 | Bajra | | 0 | | 0 | 0.0 | 0 |
| 4 | Kh.Pulses/Others | | 0 | | 0 | 0.0 | 0 |
| 5 | Til | | 0 | | 0 | 0.0 | 0 |
| 6 | Groundnuts | | 0 | | 0 | 0.0 | 0 |
| 7 | Cotton | | 0 | | 0 | 0.0 | 0 |
| | Total Kharif | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 |
| | **Rabi** | | | | | | |
| 1 | Wheat | | 0 | | 0 | 0.0 | 0 |
| 2 | Barley | | 0 | | 0 | 0.0 | 0 |
| 3 | Gram | | 0 | | 0 | 0.0 | 0 |
| 4 | Mustard | | 0 | | 0 | 0.0 | 0 |
| 5 | Others | | 0 | | 0 | 0.0 | 0 |
| | Total Rabi | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 |
| | | | | | | | |
| | **Grand Total** | **0.0** | **0** | **0.0** | **0** | **0.0** | **0** |

CCA = ha

Note:
Cultivation area of other crops in Kharif season such as groundnuts, soybeans, cotton, guar etc. shall be included in area of "Kh.

## Annex 9.2: Cost of Inputs, Crop Yields and other Parameters

### Without Rehabilitation

| | Crop | Gross Receipts | | | | | | (1) Expenditure on Seed | | | (2) Expenditure on fertilizer and manure | (3) Expenditure onLabour/bullock | | (8) Plant protection |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Rate 1/ (Financial) [Rs./q] | Rate 2/ (Economic) [Rs./q] | Yield 3/ [q/ha] | Gross value of farm produce [Rs./ha] | Value of by-products [%] | Value of by-products [Rs./ha] | Input of seed [kg/ha] | Rate of seed [Rs./kg] | Cost of seed [Rs./ha] | [Rs./ha] | Family/owned labour/bullock [Rs./ha] | Hired labour/bullock [Rs./ha] | [Rs./ha] |
| | **KHARIF** | | | | | | | | | | | | | |
| 1 | Maize | 1,715 | 1,189 | 16.0 | 27,440 | 20% | 5,488 | 29 | 74 | 2,146 | 3,513 | 23,880 | 8,172 | - |
| 2 | Jowar | 1,864 | 1,789 | 5.5 | 10,252 | 50% | 5,126 | 9 | 72 | 648 | 2,141 | 5,262 | 9,302 | - |
| 3 | Bajra | 1,446 | 1,388 | 9.1 | 13,159 | 50% | 6,580 | 5 | 188 | 940 | 1,121 | 10,206 | 5,215 | - |
| 4 | Kh.Pulses | 6,219 | 5,970 | 4.0 | 24,876 | 10% | 2,488 | 15 | 120 | 1,800 | 1,058 | 7,790 | 6,476 | 300 |
| 5 | Til | 9,743 | 9,353 | 2.9 | 28,255 | 0% | - | 4 | 131 | 524 | 587 | 7,559 | 4,228 | - |
| 6 | Groundnut | 4,536 | 4,355 | 16.5 | 74,844 | 10% | 7,484 | 115 | 83 | 9,545 | 3,951 | 17,565 | 15,411 | 880 |
| 7 | Cotton | 5,898 | 5,662 | 20.3 | 119,729 | 5% | 5,986 | 1,462 | 4 | 5,848 | 6,529 | 35,136 | 12,378 | 2,940 |
| | **RABI** | | | | | | | | | | | | | |
| 1 | Wheat | 1,817 | 1,394 | 33.6 | 61,051 | 20% | 12,210 | 151 | 26 | 3,926 | 4,755 | 14,488 | 10,080 | 100 |
| 2 | Barley | 1,446 | 1,288 | 29.4 | 42,512 | 20% | 8,502 | 144 | 22 | 3,168 | 2,877 | 18,953 | 8,311 | - |
| 3 | Gram | 3,792 | 3,640 | 8.1 | 30,715 | 10% | 3,072 | 58 | 68 | 3,944 | 1,158 | 11,021 | 3,564 | 650 |
| 4 | Mustard | 3,934 | 3,782 | 13.5 | 53,109 | 0% | - | 6 | 166 | 996 | 3,100 | 11,324 | 6,572 | 100 |
| 5 | Others | 1,252 | 1,202 | 94.5 | 118,314 | 0% | - | 10 | 396 | 3,960 | 18,387 | 10,554 | 25,986 | 3,900 |

### With Rehabilitation

| | Crop | Gross Receipts | | | | | | (1) Expenditure on Seed | | | (2) Expenditure on fertilizer and manure | (3) Expenditure onLabour/bullock | | (8) Plant protection |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Rate 1/ (Financial) [Rs./q] | Rate 2/ (Economic) [Rs./q] | Yield 3/ [q/ha] | Gross value of farm produce [Rs./ha] | Value of by-products [%] | Value of by-products [Rs./ha] | Input of seed [kg/ha] | Rate of seed [Rs./kg] | Cost of seed [Rs./ha] | [Rs./ha] | Family/owned labour/bullock [Rs./ha] | Hired labour/bullock [Rs./ha] | [Rs./ha] |
| | **KHARIF** | | | | | | | | | | | | | |
| 1 | Maize | 1,715 | 1,189 | 16.8 | 28,812 | 20% | 5,762 | 29 | 78 | 2,262 | 3,689 | 23,880 | 7,990 | - |
| 2 | Jowar | 1,864 | 1,789 | 5.5 | 10,252 | 50% | 5,126 | 9 | 70 | 630 | 2,141 | 5,262 | 9,095 | - |
| 3 | Bajra | 1,446 | 1,388 | 9.1 | 13,159 | 50% | 6,580 | 5 | 183 | 915 | 1,121 | 10,206 | 5,099 | - |
| 4 | Kh.Pulses | 6,219 | 5,970 | 4.0 | 24,876 | 10% | 2,488 | 15 | 117 | 1,755 | 1,058 | 7,790 | 6,332 | 300 |
| 5 | Til | 9,743 | 9,353 | 2.9 | 28,255 | 0% | - | 4 | 128 | 512 | 587 | 7,559 | 4,134 | - |
| 6 | Groundnut | 4,536 | 4,355 | 16.5 | 74,844 | 10% | 7,484 | 115 | 83 | 9,545 | 3,951 | 17,565 | 15,411 | 880 |
| 7 | Cotton | 5,898 | 5,662 | 20.3 | 119,729 | 5% | 5,986 | 1,462 | 4 | 5,848 | 6,529 | 35,136 | 12,378 | 2,940 |
| | **RABI** | | | | | | | | | | | | | |
| 1 | Wheat | 1,817 | 1,394 | 37.0 | 67,229 | 20% | 13,446 | 151 | 27 | 4,077 | 4,993 | 15,213 | 9,856 | 105 |
| 2 | Barley | 1,446 | 1,288 | 32.3 | 46,706 | 20% | 9,341 | 144 | 23 | 3,312 | 3,021 | 19,900 | 8,126 | - |
| 3 | Gram | 3,792 | 3,640 | 9.0 | 34,128 | 10% | 3,413 | 58 | 71 | 4,118 | 1,216 | 11,572 | 3,485 | 680 |
| 4 | Mustard | 3,934 | 3,782 | 14.1 | 55,469 | 0% | - | 6 | 174 | 1,044 | 3,255 | 11,890 | 6,426 | 105 |
| 5 | Others | 1,252 | 1,202 | 99.2 | 124,198 | 0% | - | 10 | 416 | 4,160 | 19,306 | 11,082 | 25,409 | 4,095 |

Source:
1/ Calculated by JICA Survey Team based on Rajasthan Agricultural Statistics at a Glance 2013-14, published Nov. 2015, DoA, Rajasthan
2/ Economic price of maize, wheat and barley was calculated based on FOB price. The other price was calculated by using SCF = 0.96.
3/ Ave. 5 years data upto 2012-13, Rajasthan Agricultural Statistics at a Glance 2013-14, published Nov. 2015, DoA, Rajasthan
4/ Cost of cultivation data is prepared based on 2012-13 data, Estimates of Cost of Cultivation/Production & Related Data, Directorate of Economics & Statistics

Note:
- Cost of cultivation has converted to price at 2016 by using CPI (2012 to 2016, 132)
- Increase in production of 20% for wheat, barley & gram and 5% of mustard & other crops are anticipated for the crop budget with rehabilitation condition
- Increase of 5% of labour cost and material inputs are anticipated for Kharif crops with rehabilitation condition

**Annex 9.3: Value of Crop and Cost of various Inputs (Without-Rehabilitation)**

**A) GROSS RECEIPTS**

| S.No | Crop | Area[ha] | Yield | | (1) Gross value of farm produce (Financial) | | (1) Gross value of farm produce (Economic) | | (2) Value of by-products | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Average [q/ha] | Total [q] | Rate [RS./q] | Value [Rs.] | Rate [RS./q] | Value [Rs.] | Rate [Percentage] | Value [Rs.] |
| | **Kharif** | | | | | | | | | |
| 1 | Maize | - | 16.0 | - | 1,715 | - | 1,189 | - | 20% | - |
| 2 | Jowar | - | 5.5 | - | 1,864 | - | 1,789 | - | 50% | - |
| 3 | Bajra | - | 9.1 | - | 1,446 | - | 1,388 | - | 50% | - |
| 4 | Kh.Pulses/Others | - | 4.0 | - | 6,219 | - | 5,970 | - | 10% | - |
| 5 | Til | - | 2.9 | - | 9,743 | - | 9,353 | - | 0% | - |
| 6 | Groundnut | - | 16.5 | - | 4,536 | - | 4,355 | - | 10% | - |
| 7 | Cotton | - | 20.3 | - | 5,898 | - | 5,662 | - | 5% | - |
| | **Rabi** | | | | | | | | | |
| 1 | Wheat | - | 33.6 | - | 1,817 | - | 1,394 | - | 20% | - |
| 2 | Barley | - | 29.4 | - | 1,446 | - | 1,288 | - | 20% | - |
| 3 | Gram | - | 8.1 | - | 3,792 | - | 3,640 | - | 10% | - |
| 4 | Mustard | - | 13.5 | - | 3,934 | - | 3,782 | - | 0% | - |
| 5 | Others | - | 94.5 | - | 1,252 | - | 1,202 | - | 0% | - |
| | **Total** | - | | - | | - | | - | | - |

**B) FARM INPUTS**

| S.No | Crop | Area[ha] | (1) Expenditure on seeds | | (2) Expenditure on fertilizer/manures | | (3.1) Expenditure on familiy bullock and labour | | (3.2) Expenditure on hired bullock and labour | | (8) Plant Protection | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Rate [RS./ha] | Cost [Rs.] | Rate [RS./ha] | Cost [Rs.] | Rate [RS./ha] | Cost [Rs.] | Rate [RS./ha] | Cost [Rs.] | Rate [RS./ha] | Cost [Rs.] |
| | **Kharif** | | | | | | | | | | | |
| 1 | Maize | - | 2,146 | - | 3,513 | - | 23,880 | - | 8,172 | - | - | - |
| 2 | Jowar | - | 648 | - | 2,141 | - | 5,262 | - | 9,302 | - | - | - |
| 3 | Bajra | - | 940 | - | 1,121 | - | 10,206 | - | 5,215 | - | - | - |
| 4 | Kh.Pulses/Others | - | 1,800 | - | 1,058 | - | 7,790 | - | 6,476 | - | 300 | - |
| 5 | Til | - | 524 | - | 587 | - | 7,559 | - | 4,228 | - | - | - |
| 6 | Groundnut | - | 9,545 | - | 3,951 | - | 17,565 | - | 15,411 | - | 880 | - |
| 7 | Cotton | - | 5,848 | - | 6,529 | - | 35,136 | - | 12,378 | - | 2,940 | - |
| | **Rabi** | | | | | | | | - | | - | |
| 1 | Wheat | - | 3,926 | - | 4,755 | - | 14,488 | - | 10,080 | - | 100 | - |
| 2 | Barley | - | 3,168 | - | 2,877 | - | 18,953 | - | 8,311 | - | - | - |
| 3 | Gram | - | 3,944 | - | 1,158 | - | 11,021 | - | 3,564 | - | 650 | - |
| 4 | Mustard | - | 996 | - | 3,100 | - | 11,324 | - | 6,572 | - | 100 | - |
| 5 | Others | - | 3,960 | - | 18,387 | - | 10,554 | - | 25,986 | - | 3,900 | - |
| | **Total** | - | | - | | - | | - | | - | | - |

**Table: Value of Crop and Cost of various Inputs (With-Rehabilitation)**

**A) GROSS RECEIPTS**

| S.No | Crop | Area[ha] | Yield | | (1) Gross value of farm produce (Financial) | | (1) Gross value of farm produce (Economic) | | (2) Value of by-products | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Average [q/ha] | Total [q] | Rate [RS./q] | Value [Rs.] | Rate [RS./q] | Value [Rs.] | Rate [Percentage] | Value [Rs.] |
| | **Kharif** | | | | | | | | | |
| 1 | Maize | - | 16.8 | - | 1,715 | - | 1,189 | - | 20% | - |
| 2 | Jowar | - | 5.5 | - | 1,864 | - | 1,789 | - | 50% | - |
| 3 | Bajra | - | 9.1 | - | 1,446 | - | 1,388 | - | 50% | - |
| 4 | Kh.Pulses/Others | - | 4.0 | - | 6,219 | - | 5,970 | - | 10% | - |
| 5 | Til | - | 2.9 | - | 9,743 | - | 9,353 | - | 0% | - |
| 6 | Groundnut | - | 16.5 | - | 4,536 | - | 4,355 | - | 10% | - |
| 7 | Cotton | - | 20.3 | - | 5,898 | - | 5,662 | - | 5% | - |
| | **Rabi** | | | | | | | | | |
| 1 | Wheat | - | 37.0 | - | 1,817 | - | 1,394 | - | 20% | - |
| 2 | Barley | - | 32.3 | - | 1,446 | - | 1,288 | - | 20% | - |
| 3 | Gram | - | 9.0 | - | 3,792 | - | 3,640 | - | 10% | - |
| 4 | Mustard | - | 14.1 | - | 3,934 | - | 3,782 | - | 0% | - |
| 5 | Others | - | 99.2 | - | 1,252 | - | 1,202 | - | 0% | - |
| | **Total** | - | | - | | - | | - | | - |

**B) FARM INPUTS**

| S.No | Crop | Area[ha] | (1) Expenditure on seeds | | (2) Expenditure on fertilizer/manures | | (3.1) Expenditure on familiy bullock and labour | | (3.2) Expenditure on hired bullock and labour | | (8) Plant Protection | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Rate [RS./ha] | Cost [Rs.] | Rate [RS./ha] | Cost [Rs.] | Rate [RS./ha] | Cost [Rs.] | Rate [RS./ha] | Cost [Rs.] | Rate [RS./ha] | Cost [Rs.] |
| | **Kharif** | | | | | | | | | | | |
| 1 | Maize | - | 2,262 | - | 3,689 | - | 23,880 | - | 7,990 | - | - | - |
| 2 | Jowar | - | 630 | - | 2,141 | - | 5,262 | - | 9,095 | - | - | - |
| 3 | Bajra | - | 915 | - | 1,121 | - | 10,206 | - | 5,099 | - | - | - |
| 4 | Kh.Pulses/Others | - | 1,755 | - | 1,058 | - | 7,790 | - | 6,332 | - | 300 | - |
| 5 | Til | - | 512 | - | 587 | - | 7,559 | - | 4,134 | - | - | - |
| 6 | Groundnut | - | 9,545 | - | 3,951 | - | 17,565 | - | 15,411 | - | 880 | - |
| 7 | Cotton | - | 5,848 | - | 6,529 | - | 35,136 | - | 12,378 | - | 2,940 | - |
| | **Rabi** | | | | | | | | | | | |
| 1 | Wheat | - | 4,077 | - | 4,993 | - | 15,213 | - | 9,856 | - | 105 | - |
| 2 | Barley | - | 3,312 | - | 3,021 | - | 19,900 | - | 8,126 | - | - | - |
| 3 | Gram | - | 4,118 | - | 1,216 | - | 11,572 | - | 3,485 | - | 680 | - |
| 4 | Mustard | - | 1,044 | - | 3,255 | - | 11,890 | - | 6,426 | - | 105 | - |
| 5 | Others | - | 4,160 | - | 19,306 | - | 11,082 | - | 25,409 | - | 4,095 | - |
| | **Total** | - | | - | | - | | - | | - | | - |

## Annex 9.4: Annual Net Receipt (Total Gross Margin)

**Without-Rehabilitation**

| | Type of Produce/Input | Product Value/Cost of Farm Inputs [Rs.] | | | | |
|---|---|---|---|---|---|---|
| | | Factors | Financial | Conversion Factor | | Economic |
| (A) | **Gross Receipts** | | | | | |
| | (1) Gross value of farm produce | - | - | | | - |
| | (2) Value of by-products | - | - | 1/ | 0.96 | - |
| | (3) Dung receipts at 30% of the fodder expenditure | 30.0% | - | 1/ | 0.96 | - |
| | **Total Gross Receipts** | | - | | | - |
| (B) | **Farm Inputs** | | | | | |
| | (1) Expenditure on seeds | - | - | 2/ | 1.14 | - |
| | (2) Expenditure on fertilizer/manures | - | - | 2/ | 1.14 | - |
| | (3.1) Expenditure on family bullock and labour | - | - | 3/ | 0.90 | - |
| | (3.2) Expenditure on hired bullock and labour | - | - | 3/ | 0.90 | - |
| | (4) Fodder expenditure (15% of the gross value of produce) | 15.0% | - | 1/ | 0.96 | - |
| | (5) Depreciation on implements (2.7% of the gross value of farm produce) | 2.7% | - | 1/ | 0.96 | - |
| | (6) Share and cash rent (5% of the gross value of produce) | 5.0% | - | 1/ | 0.96 | - |
| | (7) Land revenue (2% of the gross value of farm produce) | 2.0% | - | 1/ | 0.96 | - |
| | (8) Plant Protection | - | - | 2/ | 1.14 | - |
| | **Total Farm Inputs** | | - | | | - |
| **(C)** | **Net Receipts (Total Gross Margin) (Total A – B)** | | - | | | - |

1/ Standard Conversion factor = 0.96
2/ Standard conversion factor + subsidised portion (20%) - VAT (5.5%), conversion factor = 0.96/(1-20%)/(1+5.5%)
3/ Shadow Wage Rate = 0.9

**With-Rehabilitation**

| | Type of Produce/Input | Product Value/Cost of Farm Inputs [Rs.] | | | | |
|---|---|---|---|---|---|---|
| | | Factors | Financial | Conversion Factor | | Economic |
| (A) | **Gross Receipts** | | | | | |
| | (1) Gross value of farm produce | - | - | | | - |
| | (2) Value of by-products | - | - | 1/ | 0.96 | - |
| | (3) Dung receipts at 45% of the fodder expenditure | 30.0% | - | 1/ | 0.96 | - |
| | **Total Gross Receipts** | | - | | | - |
| (B) | **Farm Inputs** | | | | | |
| | (1) Expenditure on seeds | - | - | 2/ | 1.05 | - |
| | (2) Expenditure on fertilizer/manures | - | - | 2/ | 1.05 | - |
| | (3.1) Expenditure on familiy bullock and labour | - | - | 3/ | 0.90 | - |
| | (3.2) Expenditure on hired bullock and labour | - | - | 3/ | 0.90 | - |
| | (4) Fodder expenditure (10% of the gross value of produce) | 10.0% | - | 1/ | 0.96 | - |
| | (5) Depreciation on implements (2.7% of the gross value of farm produce) | 2.7% | - | 1/ | 0.96 | - |
| | (6) Share and cash rent (3% of the gross value of produce) | 3.0% | - | 1/ | 0.96 | - |
| | (7) Land revenue (2% of the gross value of farm produce) | 2.0% | - | 1/ | 0.96 | - |
| | (8) Plant Protection | - | - | 2/ | 1.05 | - |
| | **Total Farm Inputs** | | - | | | - |
| **(C)** | **Net Receipts (Total Gross Margin) (Total A – B)** | | - | | | - |

1/ Standard Conversion factor = 0.96
2/ Standard conversion factor + subsidised portion (20%) - VAT (14.5%), conversion factor = 0.96/(1-20%)/(1+14.5%)
3/ Shadow Wage Rate = 0.9

**Annex 9.5: Cash Flow Schedule and EIRR**

**1. Annual Net Receipts, Without Rehabilitation [Rs.'000]**

| | | |
|---|---|---|
| Irrigated: | - | ha |
| Unirrigated: | - | ha |
| **Total crop area:** | - | ha |
| **Total economic gross margin:** | - | |

**2. Annual Net Receipts, With Rehabilitation [Rs.'000]**

| | | |
|---|---|---|
| Irrigated: | - | ha |
| Unirrigated: | - | ha |
| **Total crop area:** | - | ha |
| **Total economic gross margin:** | - | |

**3. Annual Incremental Economic Value of Production [Rs.'000]**

-

**Discout Rate**

i = **12%**

**4. Capital Cost [Rs.'000]**

**166,000**

SID = 4%
Consultancy = 6%

**4. Cash Flow [Rs.'000]** (Unit: INR Thousand)

| Year | Cost | | | | Total Cost | Benefit | Total Benefit |
|---|---|---|---|---|---|---|---|
| | Civil Works | SID Work | Consultancy | O&M | | | |
| 1 | | 6,640 | 1,245 | | 7,885 | 0 | -7,885 |
| 2 | 166,000 | | 1,245 | | 167,245 | 0 | -167,245 |
| 3 | | | 1,245 | 3,285 | 4,530 | 0 | -4,530 |
| 4 | | | 1,245 | 3,285 | 4,530 | 0 | -4,530 |
| 5 | | | 1,245 | 3,285 | 4,530 | 0 | -4,530 |
| 6 | | | 1,245 | 3,285 | 4,530 | 0 | -4,530 |
| 7 | | | 1,245 | 3,285 | 4,530 | 0 | -4,530 |
| 8 | | | 1,245 | 3,285 | 4,530 | 0 | -4,530 |
| 9 | | | | 3,285 | 3,285 | 0 | -3,285 |
| 10 | | | | 3,285 | 3,285 | 0 | -3,285 |
| 11 | | | | 3,285 | 3,285 | 0 | -3,285 |
| 12 | | | | 3,285 | 3,285 | 0 | -3,285 |
| 13 | | | | 3,285 | 3,285 | 0 | -3,285 |
| 14 | | | | 3,285 | 3,285 | 0 | -3,285 |
| 15 | | | | 3,285 | 3,285 | 0 | -3,285 |
| 16 | | | | 3,285 | 3,285 | 0 | -3,285 |
| 17 | | | | 3,285 | 3,285 | 0 | -3,285 |
| 18 | | | | 3,285 | 3,285 | 0 | -3,285 |
| 19 | | | | 3,285 | 3,285 | 0 | -3,285 |
| 20 | | | | 3,285 | 3,285 | 0 | -3,285 |
| 21 | | | | 3,285 | 3,285 | 0 | -3,285 |
| 22 | | | | 3,285 | 3,285 | 0 | -3,285 |
| 23 | | | | 3,285 | 3,285 | 0 | -3,285 |
| 24 | | | | 3,285 | 3,285 | 0 | -3,285 |
| 25 | | | | 3,285 | 3,285 | 0 | -3,285 |
| 26 | | | | 3,285 | 3,285 | 0 | -3,285 |
| 27 | | | | 3,285 | 3,285 | 0 | -3,285 |
| 28 | | | | 3,285 | 3,285 | 0 | -3,285 |
| 29 | | | | 3,285 | 3,285 | 0 | -3,285 |
| 30 | | | | 3,285 | 3,285 | 0 | -3,285 |
| | | | | | #### | **0** | **-165,357** |

**Present Value** (Unit: INR Thousand)

| Total Cost | Gross Benefit | Total Benefit |
|---|---|---|
| 7,040 | 0 | -7,040 |
| 133,327 | 0 | -133,327 |
| 3,224 | 0 | -3,224 |
| 2,879 | 0 | -2,879 |
| 2,570 | 0 | -2,570 |
| 2,295 | 0 | -2,295 |
| 2,049 | 0 | -2,049 |
| 1,830 | 0 | -1,830 |
| 1,185 | 0 | -1,185 |
| 1,058 | 0 | -1,058 |
| 944 | 0 | -944 |
| 843 | 0 | -843 |
| 753 | 0 | -753 |
| 672 | 0 | -672 |
| 600 | 0 | -600 |
| 536 | 0 | -536 |
| 478 | 0 | -478 |
| 427 | 0 | -427 |
| 381 | 0 | -381 |
| 341 | 0 | -341 |
| 304 | 0 | -304 |
| 271 | 0 | -271 |
| 242 | 0 | -242 |
| 216 | 0 | -216 |
| 193 | 0 | -193 |
| 173 | 0 | -173 |
| 154 | 0 | -154 |
| 138 | 0 | -138 |
| 123 | 0 | -123 |
| 110 | 0 | -110 |

**Economic Value Indicators**

| | |
|---|---|
| **Net Present Value (NPV)** | **-165,357** |
| **Benefit / Cost Ratio (B/C)** | **0.00** |
| **Economic Internal Rate of Return (EIRR)** | **#DIV/0!** |

**Benefit Increase**

| Year | Overall |
|---|---|
| 1 | 0% |
| 2 | 0% |
| 3 | 10% |
| 4 | 30% |
| 5 | 70% |
| 6 | 100% |
| 7 | 100% |
| 8 | 100% |
| 9 | 100% |
| 10 | 100% |
| 11 | 100% |
| 12 | 100% |
| 13 | 100% |
| 14 | 100% |
| 15 | 100% |
| 16 | 100% |
| 17 | 100% |
| 18 | 100% |
| 19 | 100% |
| 20 | 100% |
| 21 | 100% |
| 22 | 100% |
| 23 | 100% |
| 24 | 100% |
| 25 | 100% |
| 26 | 100% |
| 27 | 100% |
| 28 | 100% |
| 29 | 100% |
| 30 | 100% |

**Note:** Annual Discount Rate: i = 12%

**Annex 9.6: Calculation of Benefit Cost Ratio**

| Benefits Cost Ratio | | | |
|---|---|---|---|
| | | Without Rehabilitation | With Rehabilitation |
| (A) | GROSS RECEIPTS | | |
| 1 | Gross value of farm produce | 0 | 0 |
| 2 | Value of by-products | 0 | 0 |
| 3 | Dung receipts at 30% of the fodder expenditure | 0 | 0 |
| 4 | Total (A) : Gross Receipts (1+2+3) | **0** | **0** |
| (B) | FARM INPUTS | | |
| 1 | Expenditure on seeds | 0 | 0 |
| 2 | Expenditure on fertilizer/manures etc. | 0 | 0 |
| 3 | Expenditure on hired bullock and labour | 0 | 0 |
| 4 | Fodder expenditure (15%/10% of the gross value of produce) | 0 | 0 |
| 5 | Depreciation on implements (2.7% of the gross value of farm produce) | 0 | 0 |
| 6 | Share and cash rent (5%/3% of the gross value of produce) | 0 | 0 |
| 7 | Land revenue (2% of the gross value of farm produce) | 0 | 0 |
| 9 | Total ( B ) Expenses (1 to 6) | **0** | **0** |
| (C ) | NET VALUE OF PRODUCE | | |
| 1 | Total Gross Receipts (Total A.4) | 0 | 0 |
| 2 | Minus Total Expenses (Total B.7) | 0 | 0 |
| 3 | Net Value of Produce (C ) :(1-2) | **0** | **0** |
| (D) | ANNUAL AGRICULTURE BENEFITS: | | |
| 1 | Net Value with rehabilitation (C.3) | | 0 |
| 2 | Minus Net Value without rehabilitation (C.3) | | 0 |
| 3 | Net Annual Benefits (D ) :(1-2) | | **0** |
| (E) | Other net annual benefits due to aqua- culture including pisiciculture, drinking & industrial water supply, hydro power generation, animal husbandry etc.(average Rs 5.0 lakh per sub project) | | |
| (F) | TOTAL NET ANNUAL BENEFITS (D+E) | | 0 |
| (G) | ANNUAL COSTS: | | |
| 1 | Interest on capital @10% (Estimated total cost of the project ) | | 18,300,000 |
| 2 | Depreciation of the project @ 2% of the cost of the project | | 3,660,000 |
| 3 | Annual operation and maintenance charges @657 per ha of CCA | | - |
| 4 | Maintenance of the head works @ 1.0% of its cost | | - |
| 5 | Depriciation of the pumping system @ 8.33% of the estimated cost of the pumping system assuming life of the system as 12 years (Applicable to lift irrigation) | | 0 |
| 6 | Depriciation of the raising mains @3.33% of the estimated cost of the raising mains assuming life of the system as 30 years (Applicable to lift irrigation) | | 0 |
| 7 | Power charges for lift irrigation @ Rs…per ha(applicable to lift irrigation) | | 0 |
| 8 | Total ( G ) Annual costs(1 to 7) | | 21,960,000 |
| | BENEFIT COST RATIO = F: Annual Benefits/G8: Annual Costs | | 0.00 |

Total Cost
183,000,000

**Water Resource Department (WRD),**
**The State of Rajasthan, Republic of India**

**DETAILED PROJECT REPORT**
**ON**
**REHABILITATION OF WEST BANAS IRRIGATION SUB-PROJECT**

# Volume-2:COST ESTIMATE

**August 2016**

**Rajasthan Water Sector Livelihood Improvement Project (RWSLIP)**

**Sub-PMU 3 for Udaipur and Jodhpur Zones**

# Basic Conditions for Cost Estimate

i) Basic Schedule of Rates for Sirohi District, year 2014 was applied to the cost estimate.
ii) 6% of price escalation was applied to adjust the price to April 2016 level.
iii) Target area for installation of micro irrigation system is assumed as 5.5% of total CCA consisting of 5.0% for sprinkler irrigation system and 0.5% for drip irrigation system and unit rate of INR 49,731 / ha for sprinkler irrigation system and INR 82,010 / ha for drip irrigation system was applied for cost estimation, respectively.

# List of Unit Prices applied to Cost Estimate

Basic Schedule of Rates for Sirohi District, year 2014
6% of price escalation was applied to adjust the price to April 2016 level

| S.No. | Item | Unit Price (2014) | Price Escalation | Applied for Cost Estimate |
|---|---|---|---|---|
| | | (a) | (b) = (a) x 6% | (c) = (a) + (b) |
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# Overall Summary of Cost Estimate

Name of the Sub-project: Rehabilitation of West Banas Irrigation Sub-project
District: Sirohi District

| No. | Description (Proposed Activity) | Estimated Cost (INR thousand) |
|---|---|---|
| 1 | Rehabilitation of West Banas Dam | |
| 1.1 | Dam body and intake structure | xxx |
| 1.2 | Spillway (rehabilitation of downstream walls at settling basin) | xxx |
| 1.3 | Provision of filter toe | xxx |
| | Sub-total 1 | xxx |
| 2 | Rehabilitation of Right Main Canal System | |
| 2.1 | Rehabilitation of right main canal and related structures | |
| (1) | Rehabilitation of existing canal lining | xxx |
| (2) | Construction/rehabilitation of related structures | xxx |
| 2.2 | Rehabilitation of minor canals and related structures (right main canal system) | |
| (1) | Rehabilitation of existing canal lining | xxx |
| (2) | Construction/rehabilitation of related structures | xxx |
| | Sub-total 2 | xxx |
| 3 | Rehabilitation of Left Main Canal System | |
| 3.1 | Rehabilitation of left main canal and related structures | |
| (1) | Rehabilitation of existing canal lining | xxx |
| (2) | Provision of new canal lining | xxx |
| (3) | Construction/rehabilitation of related structures | xxx |
| 3.2 | Rehabilitation of minor canals and related structures (left main canal system) | |
| (1) | Rehabilitation of existing canal lining | xxx |
| (2) | Construction/rehabilitation of related structures | xxx |
| | Sub-total 3 | xxx |
| 4 | Promotion of Micro Irrigation System (target area to be developed) | |
| 4.1 | Construction and installation of community based sprinkler system | xxx |
| 4.2 | Construction and installation of individual farmer based drip system | xxx |
| | Sub-total 4 | xxx |
| 5 | Construction of WUA Constructive Facilities | |
| 5.1 | Construction of xxxxxxx at xxxxxxx | xxx |
| | Sub-total 5 | xxx |
| 6 | Support for Gender Mainstreaming Activities | |
| 6.1 | Construction of xxxxxx at xxxxxx | xxx |
| 6.2 | Construction of xxxxxx at xxxxxx | xxx |
| 6.3 | Planting of xxxxxx at xxxxxx | xxx |
| 6.4 | Planting of xxxxxx at xxxxxx | xxx |
| | Sub-total 6 | xxx |
| **Total (1 - 6)** | | **xxx** |

# Summary of Cost Estimate for Rehabilitation of West Banas Dam

Name of the Sub-project: Rehabilitation of West Banas Irrigation Sub-project
District: Sirohi District

| No. | Description (Proposed Activity) | Estimated Cost (INR thousand) |
|---|---|---|
| 1 | Rehabilitation of West Banas Dam | |
| 1.1 | Dam body and intake structure | |
| (1) | Clearing of bush and trees | xxx |
| (2) | Rehabilitation of dam embankment (widening of top of dam, 6 m) | xxx |
| (3) | Repair of riprap | xxx |
| (4) | Provision of quarry spalls on top of dam body | xxx |
| (5) | Sod facing for downstream slope | xxx |
| (6) | Repair of intake structure (wall and sluice gates) | xxx |
| 1.2 | Spillway (rehabilitation of downstream walls at settling basin) | xxx |
| 1.3 | Provision of filter toe | xxx |
| **Total** | | **xxx** |

# Abstract of Cost for Clearing of Bush and Trees _ Dam

Name of the Sub-project: Rehabilitation of West Banas Irrigation Sub-project
District: Sirohi District
Type of the Works: Rehabilitation of West Bans Dam _ dam body and intake structure
Reference Drawing: Drawing no.....

| No. | Particulars of Item | Unit | Quantity | Unit Rate (INR) | Amount (INR) |
|---|---|---|---|---|---|
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| **Total** | | | | | **xxx** |

# Quantity Calculations for Clearing of Bush and Trees _ Dam

Name of the Sub-project: Rehabilitation of West Banas Irrigation Sub-project
District: Sirohi District
Type of the Works: Rehabilitation of West Bans Dam _ dam body and intake structure
Reference Drawing: Drawing no.....

| No. | Particulars of Item | Unit | No | L | B | H/D | Qty. |
|---|---|---|---|---|---|---|---|
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# Abstract of Cost for Rehabilitation of Dam Embankment _ Dam

Name of the Sub-project: Rehabilitation of West Banas Irrigation Sub-project
District: Sirohi District
Type of the Works: Rehabilitation of West Bans Dam _ dam body and intake structure
Reference Drawing: Drawing no.....

| No. | Particulars of Item | Unit | Quantity | Unit Rate (INR) | Amount (INR) |
|---|---|---|---|---|---|
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| **Total** | | | | | **xxx** |

# Quantity Calculations for Rehabilitation of Dam Embankment _ Dam

Name of the Sub-project: Rehabilitation of West Banas Irrigation Sub-project
District: Sirohi District
Type of the Works: Rehabilitation of West Bans Dam _ dam body and intake structure
Reference Drawing: Drawing no.....

| No. | Particulars of Item | Unit | No | L | B | H/D | Qty. |
|---|---|---|---|---|---|---|---|
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# Abstract of Cost for Repair of Riprap _ Dam

Name of the Sub-project: Rehabilitation of West Banas Irrigation Sub-project
District: Sirohi District
Type of the Works: Rehabilitation of West Bans Dam _ dam body and intake structure
Reference Drawing: Drawing no.....

| No. | Particulars of Item | Unit | Quantity | Unit Rate (INR) | Amount (INR) |
|---|---|---|---|---|---|
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| **Total** | | | | | **xxx** |

# Quantity Calculations for Repair of Riprap _ Dam

Name of the Sub-project: Rehabilitation of West Banas Irrigation Sub-project
District: Sirohi District
Type of the Works: Rehabilitation of West Bans Dam _ dam body and intake structure
Reference Drawing: Drawing no.....

| No. | Particulars of Item | Unit | No | L | B | H/D | Qty. |
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# Abstract of Cost for Provision of Quarry Spalls _ Dam

Name of the Sub-project: Rehabilitation of West Banas Irrigation Sub-project
District: Sirohi District
Type of the Works: Rehabilitation of West Bans Dam _ dam body and intake structure
Reference Drawing: Drawing no.....

| No. | Particulars of Item | Unit | Quantity | Unit Rate (INR) | Amount (INR) |
|---|---|---|---|---|---|
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| **Total** | | | | | **xxx** |

# Quantity Calculations for Provision of Quarry Spalls _ Dam

Name of the Sub-project: Rehabilitation of West Banas Irrigation Sub-project
District: Sirohi District
Type of the Works: Rehabilitation of West Bans Dam _ dam body and intake structure
Reference Drawing: Drawing no.....

| No. | Particulars of Item | Unit | No | L | B | H/D | Qty. |
|---|---|---|---|---|---|---|---|
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# Abstract of Cost for Sod Facing _ Dam

Name of the Sub-project: Rehabilitation of West Banas Irrigation Sub-project
District: Sirohi District
Type of the Works: Rehabilitation of West Bans Dam _ dam body and intake structure
Reference Drawing: Drawing no.....

| No. | Particulars of Item | Unit | Quantity | Unit Rate (INR) | Amount (INR) |
|---|---|---|---|---|---|
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| **Total** | | | | | **xxx** |

# Quantity Calculations for Sod Facing _ Dam

Name of the Sub-project: Rehabilitation of West Banas Irrigation Sub-project
District: Sirohi District
Type of the Works: Rehabilitation of West Bans Dam _ dam body and intake structure
Reference Drawing: Drawing no.....

| No. | Particulars of Item | Unit | No | L | B | H/D | Qty. |
|---|---|---|---|---|---|---|---|
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# Abstract of Cost for Repair of Intake Structure _ Dam

Name of the Sub-project: Rehabilitation of West Banas Irrigation Sub-project
District: Sirohi District
Type of the Works: Rehabilitation of West Bans Dam _ dam body and intake structure
Reference Drawing: Drawing no.....

| No. | Particulars of Item | Unit | Quantity | Unit Rate (INR) | Amount (INR) |
|---|---|---|---|---|---|
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| **Total** | | | | | **xxx** |

# Quantity Calculations for Repair of Intake Structure _ Dam

Name of the Sub-project: Rehabilitation of West Banas Irrigation Sub-project
District: Sirohi District
Type of the Works: Rehabilitation of West Bans Dam _ dam body and intake structure
Reference Drawing: Drawing no.....

| No. | Particulars of Item | Unit | No | L | B | H/D | Qty. |
|---|---|---|---|---|---|---|---|
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# Abstract of Cost for Rehabilitation of Spillway _ Dam

Name of the Sub-project: Rehabilitation of West Banas Irrigation Sub-project
District: Sirohi District
Type of the Works: Rehabilitation of West Bans Dam _ dam body and intake structure
Reference Drawing: Drawing no.....

| No. | Particulars of Item | Unit | Quantity | Unit Rate (INR) | Amount (INR) |
|---|---|---|---|---|---|
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| **Total** | | | | | **xxx** |

# Quantity Calculations for Rehabilitation of Spillway _ Dam

Name of the Sub-project: Rehabilitation of West Banas Irrigation Sub-project
District: Sirohi District
Type of the Works: Rehabilitation of West Bans Dam _ dam body and intake structure
Reference Drawing: Drawing no.....

| No. | Particulars of Item | Unit | No | L | B | H/D | Qty. |
|---|---|---|---|---|---|---|---|
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# Abstract of Cost for Provision of Filter Toe _ Dam

Name of the Sub-project: Rehabilitation of West Banas Irrigation Sub-project
District: Sirohi District
Type of the Works: Rehabilitation of West Bans Dam _ dam body and intake structure
Reference Drawing: Drawing no.....

| No. | Particulars of Item | Unit | Quantity | Unit Rate (INR) | Amount (INR) |
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| **Total** | | | | | **xxx** |

# Quantity Calculations for Provision of Filter Toe _ Dam

Name of the Sub-project: Rehabilitation of West Banas Irrigation Sub-project
District: Sirohi District
Type of the Works: Rehabilitation of West Bans Dam _ dam body and intake structure
Reference Drawing: Drawing no.....

| No. | Particulars of Item | Unit | No | L | B | H/D | Qty. |
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# Summary of Cost Estimate for Rehabilitation of Right Main Canal System

Name of the Sub-project: Rehabilitation of West Banas Irrigation Sub-project
District: Sirohi District

| No. | Description (Proposed Activity) | Estimated Cost (INR thousand) |
|---|---|---|
| 2 | Rehabilitation of Right Main Canal System | |
| 2.1 | Rehabilitation of right main canal and related structures | |
| (1) | Rehabilitation of existing canal lining | xxx |
| (2) | Construction/rehabilitation of related structures | |
| (a) | Provision of measuring devices | xxx |
| (b) | Rehabilitation of aqueduct | xxx |
| (c) | Rehabilitation of siphon | xxx |
| (d) | Rehabilitation of falls | xxx |
| (e) | Rehabilitation of VRBs | xxx |
| (f) | Replacement of outlets | xxx |
| 2.2 | Rehabilitation of minor canals and related structures (right main canal system) | |
| (1) | Rehabilitation of existing canal lining | xxx |
| (2) | Construction/rehabilitation of related structures | |
| (a) | Provision of measuring devices | xxx |
| (b) | Rehabilitation of aqueduct | xxx |
| (c) | Rehabilitation of siphon | xxx |
| (d) | Rehabilitation of falls | xxx |
| (e) | Rehabilitation of VRBs | xxx |
| (f) | Replacement of outlets | xxx |
| **Total** | | **xxx** |

# Abstract of Cost for Rehabilitation of Existing Canal Lining _ RMC

Name of the Sub-project: Rehabilitation of West Banas Irrigation Sub-project
District: Sirohi District
Type of the Works: Rehabilitation of RMC System _ Right Main Canal
Reference Drawing: Drawing no.....

| No. | Particulars of Item | Unit | Quantity | Unit Rate (INR) | Amount (INR) |
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| **Total** | | | | | **xxx** |

# Quantity Calculations for Rehabilitation of Existing Canal Lining _ RMC

Name of the Sub-project: Rehabilitation of West Banas Irrigation Sub-project
District: Sirohi District
Type of the Works: Rehabilitation of RMC System _ Right Main Canal
Reference Drawing: Drawing no.....

| No. | Particulars of Item | Unit | No | L | B | H/D | Qty. |
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# Abstract of Cost for Provision of Measuring Devices _ RMC

Name of the Sub-project: Rehabilitation of West Banas Irrigation Sub-project
District: Sirohi District
Type of the Works: Rehabilitation of RMC System _ Right Main Canal
Reference Drawing: Drawing no.....

| No. | Particulars of Item | Unit | Quantity | Unit Rate (INR) | Amount (INR) |
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| **Total** | | | | | **xxx** |

# Quantity Calculations for Provision of Measuring Devices _ RMC

Name of the Sub-project: Rehabilitation of West Banas Irrigation Sub-project
District: Sirohi District
Type of the Works: Rehabilitation of RMC System _ Right Main Canal
Reference Drawing: Drawing no.....

| No. | Particulars of Item | Unit | No | L | B | H/D | Qty. |
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# Abstract of Cost for Rehabilitation of Aqueduct _ RMC

Name of the Sub-project: Rehabilitation of West Banas Irrigation Sub-project
District: Sirohi District
Type of the Works: Rehabilitation of RMC System _ Right Main Canal
Reference Drawing: Drawing no.....

| No. | Particulars of Item | Unit | Quantity | Unit Rate (INR) | Amount (INR) |
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| **Total** | | | | | **xxx** |

# Quantity Calculations for Rehabilitation of Aqueduct _ RMC

Name of the Sub-project: Rehabilitation of West Banas Irrigation Sub-project
District: Sirohi District
Type of the Works: Rehabilitation of RMC System _ Right Main Canal
Reference Drawing: Drawing no.....

| No. | Particulars of Item | Unit | No | L | B | H/D | Qty. |
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# Abstract of Cost for Rehabilitation of Siphon _ RMC

Name of the Sub-project: Rehabilitation of West Banas Irrigation Sub-project
District: Sirohi District
Type of the Works: Rehabilitation of RMC System _ Right Main Canal
Reference Drawing: Drawing no.....

| No. | Particulars of Item | Unit | Quantity | Unit Rate (INR) | Amount (INR) |
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| **Total** | | | | | **xxx** |

# Quantity Calculations for Rehabilitation of Siphon _ RMC

Name of the Sub-project: Rehabilitation of West Banas Irrigation Sub-project
District: Sirohi District
Type of the Works: Rehabilitation of RMC System _ Right Main Canal
Reference Drawing: Drawing no.....

| No. | Particulars of Item | Unit | No | L | B | H/D | Qty. |
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# Abstract of Cost for Rehabilitation of Falls _ RMC

Name of the Sub-project: Rehabilitation of West Banas Irrigation Sub-project
District: Sirohi District
Type of the Works: Rehabilitation of RMC System _ Right Main Canal
Reference Drawing: Drawing no.....

| No. | Particulars of Item | Unit | Quantity | Unit Rate (INR) | Amount (INR) |
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| **Total** | | | | | **xxx** |

# Quantity Calculations for Rehabilitation of Falls _ RMC

Name of the Sub-project: Rehabilitation of West Banas Irrigation Sub-project
District: Sirohi District
Type of the Works: Rehabilitation of RMC System _ Right Main Canal
Reference Drawing: Drawing no.....

| No. | Particulars of Item | Unit | No | L | B | H/D | Qty. |
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# Abstract of Cost for Rehabilitation of VRBs _ RMC

Name of the Sub-project: Rehabilitation of West Banas Irrigation Sub-project
District: Sirohi District
Type of the Works: Rehabilitation of RMC System _ Right Main Canal
Reference Drawing: Drawing no.....

| No. | Particulars of Item | Unit | Quantity | Unit Rate (INR) | Amount (INR) |
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| **Total** | | | | | **xxx** |

# Quantity Calculations for Rehabilitation of VRBs _ RMC

Name of the Sub-project: Rehabilitation of West Banas Irrigation Sub-project
District: Sirohi District
Type of the Works: Rehabilitation of RMC System _ Right Main Canal
Reference Drawing: Drawing no.....

| No. | Particulars of Item | Unit | No | L | B | H/D | Qty. |
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# Abstract of Cost for Rehabilitation of Outlets _ RMC

Name of the Sub-project: Rehabilitation of West Banas Irrigation Sub-project
District: Sirohi District
Type of the Works: Rehabilitation of RMC System _ Right Main Canal
Reference Drawing: Drawing no.....

| No. | Particulars of Item | Unit | Quantity | Unit Rate (INR) | Amount (INR) |
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| **Total** | | | | | **xxx** |

# Quantity Calculations for Rehabilitation of Outlets _ RMC

Name of the Sub-project: Rehabilitation of West Banas Irrigation Sub-project
District: Sirohi District
Type of the Works: Rehabilitation of RMC System _ Right Main Canal
Reference Drawing: Drawing no.....

| No. | Particulars of Item | Unit | No | L | B | H/D | Qty. |
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# Abstract of Cost for Rehabilitation of Existing Canal Lining _ Minor Canals _ RMC

Name of the Sub-project: Rehabilitation of West Banas Irrigation Sub-project
District: Sirohi District
Type of the Works: Rehabilitation of RMC System _ Minor Canals
Reference Drawing: Drawing no.....

| No. | Particulars of Item | Unit | Quantity | Unit Rate (INR) | Amount (INR) |
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| **Total** | | | | | **xxx** |

# Quantity Calculations for Rehabilitation of Existing Canal Lining _ Minor Canals _ RMC

Name of the Sub-project: Rehabilitation of West Banas Irrigation Sub-project
District: Sirohi District
Type of the Works: Rehabilitation of RMC System _ Minor Canals
Reference Drawing: Drawing no.....

| No. | Particulars of Item | Unit | No | L | B | H/D | Qty. |
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# Abstract of Cost for Provision of Measuring Devices _ Minor Canals _ RMC

Name of the Sub-project: Rehabilitation of West Banas Irrigation Sub-project
District: Sirohi District
Type of the Works: Rehabilitation of RMC System _ Minor Canals
Reference Drawing: Drawing no.....

| No. | Particulars of Item | Unit | Quantity | Unit Rate (INR) | Amount (INR) |
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| **Total** | | | | | **xxx** |

# Quantity Calculations for Provision of Measuring Devices _ Minor Canals _ RMC

Name of the Sub-project: Rehabilitation of West Banas Irrigation Sub-project
District: Sirohi District
Type of the Works: Rehabilitation of RMC System _ Minor Canals
Reference Drawing: Drawing no.....

| No. | Particulars of Item | Unit | No | L | B | H/D | Qty. |
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# Abstract of Cost for Rehabilitation of Aqueduct _ Minor Canals _ RMC

Name of the Sub-project: Rehabilitation of West Banas Irrigation Sub-project
District: Sirohi District
Type of the Works: Rehabilitation of RMC System _ Minor Canals
Reference Drawing: Drawing no.....

| No. | Particulars of Item | Unit | Quantity | Unit Rate (INR) | Amount (INR) |
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| **Total** | | | | | **xxx** |

# Quantity Calculations for Rehabilitation of Aqueduct _ Minor Canals _ RMC

Name of the Sub-project: Rehabilitation of West Banas Irrigation Sub-project
District: Sirohi District
Type of the Works: Rehabilitation of RMC System _ Minor Canals
Reference Drawing: Drawing no.....

| No. | Particulars of Item | Unit | No | L | B | H/D | Qty. |
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# Abstract of Cost for Rehabilitation of Siphon _ Minor Canals _ RMC

Name of the Sub-project: Rehabilitation of West Banas Irrigation Sub-project
District: Sirohi District
Type of the Works: Rehabilitation of RMC System _ Minor Canals
Reference Drawing: Drawing no.....

| No. | Particulars of Item | Unit | Quantity | Unit Rate (INR) | Amount (INR) |
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| **Total** | | | | | **xxx** |

# Quantity Calculations for Rehabilitation of Siphon _ Minor Canals _ RMC

Name of the Sub-project: Rehabilitation of West Banas Irrigation Sub-project
District: Sirohi District
Type of the Works: Rehabilitation of RMC System _ Minor Canals
Reference Drawing: Drawing no.....

| No. | Particulars of Item | Unit | No | L | B | H/D | Qty. |
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# Abstract of Cost for Rehabilitation of Falls _ Minor Canals _ RMC

Name of the Sub-project: Rehabilitation of West Banas Irrigation Sub-project
District: Sirohi District
Type of the Works: Rehabilitation of RMC System _ Minor Canals
Reference Drawing: Drawing no.....

| No. | Particulars of Item | Unit | Quantity | Unit Rate (INR) | Amount (INR) |
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| **Total** | | | | | **xxx** |

# Quantity Calculations for Rehabilitation of Falls _ Minor Canals _ RMC

Name of the Sub-project: Rehabilitation of West Banas Irrigation Sub-project
District: Sirohi District
Type of the Works: Rehabilitation of RMC System _ Minor Canals
Reference Drawing: Drawing no.....

| No. | Particulars of Item | Unit | No | L | B | H/D | Qty. |
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# Abstract of Cost for Rehabilitation of VRBs _ Minor Canals _ RMC

Name of the Sub-project: Rehabilitation of West Banas Irrigation Sub-project
District: Sirohi District
Type of the Works: Rehabilitation of RMC System _ Minor Canals
Reference Drawing: Drawing no.....

| No. | Particulars of Item | Unit | Quantity | Unit Rate (INR) | Amount (INR) |
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| **Total** | | | | | **xxx** |

# Quantity Calculations for Rehabilitation of VRBs _ Minor Canals _ RMC

Name of the Sub-project: Rehabilitation of West Banas Irrigation Sub-project
District: Sirohi District
Type of the Works: Rehabilitation of RMC System _ Minor Canals
Reference Drawing: Drawing no.....

| No. | Particulars of Item | Unit | No | L | B | H/D | Qty. |
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# Abstract of Cost for Rehabilitation of Outlets _ Minor Canals _ RMC

Name of the Sub-project: Rehabilitation of West Banas Irrigation Sub-project
District: Sirohi District
Type of the Works: Rehabilitation of RMC System _ Minor Canals
Reference Drawing: Drawing no.....

| No. | Particulars of Item | Unit | Quantity | Unit Rate (INR) | Amount (INR) |
|---|---|---|---|---|---|
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| **Total** | | | | | **xxx** |

# Quantity Calculations for Rehabilitation of Outlets _ Minor Canals _ RMC

Name of the Sub-project: Rehabilitation of West Banas Irrigation Sub-project
District: Sirohi District
Type of the Works: Rehabilitation of RMC System _ Minor Canals
Reference Drawing: Drawing no.....

| No. | Particulars of Item | Unit | No | L | B | H/D | Qty. |
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# Summary of Cost Estimate for Rehabilitation of Left Main Canal System

Name of the Sub-project: Rehabilitation of West Banas Irrigation Sub-project
District: Sirohi District

| No. | Description (Proposed Activity) | Estimated Cost (INR thousand) |
|---|---|---|
| 2 | Rehabilitation of Left Main Canal System | |
| 2.1 | Rehabilitation of left main canal and related structures | |
| (1) | Rehabilitation of existing canal lining | xxx |
| (2) | Construction/rehabilitation of related structures | |
| (a) | Provision of measuring devices | xxx |
| (b) | Rehabilitation of aqueduct | xxx |
| (c) | Rehabilitation of siphon | xxx |
| (d) | Rehabilitation of falls | xxx |
| (e) | Rehabilitation of VRBs | xxx |
| (f) | Replacement of outlets | xxx |
| 2.2 | Rehabilitation of minor canals and related structures (left main canal system) | |
| (1) | Rehabilitation of existing canal lining | xxx |
| (2) | Construction/rehabilitation of related structures | |
| (a) | Provision of measuring devices | xxx |
| (b) | Rehabilitation of aqueduct | xxx |
| (c) | Rehabilitation of siphon | xxx |
| (d) | Rehabilitation of falls | xxx |
| (e) | Rehabilitation of VRBs | xxx |
| (f) | Replacement of outlets | xxx |
| **Total** | | **xxx** |

# Abstract of Cost for Rehabilitation of Existing Canal Lining _ LMC

Name of the Sub-project: Rehabilitation of West Banas Irrigation Sub-project
District: Sirohi District
Type of the Works: Rehabilitation of LMC System _ Left Main Canal
Reference Drawing: Drawing no.....

| No. | Particulars of Item | Unit | Quantity | Unit Rate (INR) | Amount (INR) |
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| **Total** | | | | | **xxx** |

# Quantity Calculations for Rehabilitation of Existing Canal Lining _ LMC

Name of the Sub-project: Rehabilitation of West Banas Irrigation Sub-project
District: Sirohi District
Type of the Works: Rehabilitation of LMC System _ Left Main Canal
Reference Drawing: Drawing no.....

| No. | Particulars of Item | Unit | No | L | B | H/D | Qty. |
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# Abstract of Cost for Provision of Measuring Devices _ LMC

Name of the Sub-project: Rehabilitation of West Banas Irrigation Sub-project
District: Sirohi District
Type of the Works: Rehabilitation of LMC System _ Left Main Canal
Reference Drawing: Drawing no.....

| No. | Particulars of Item | Unit | Quantity | Unit Rate (INR) | Amount (INR) |
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| **Total** | | | | | **xxx** |

# Quantity Calculations for Provision of Measuring Devices _ LMC

Name of the Sub-project: Rehabilitation of West Banas Irrigation Sub-project
District: Sirohi District
Type of the Works: Rehabilitation of LMC System _ Left Main Canal
Reference Drawing: Drawing no.....

| No. | Particulars of Item | Unit | No | L | B | H/D | Qty. |
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# Abstract of Cost for Rehabilitation of Aqueduct _ LMC

Name of the Sub-project: Rehabilitation of West Banas Irrigation Sub-project
District: Sirohi District
Type of the Works: Rehabilitation of LMC System _ Left Main Canal
Reference Drawing: Drawing no.....

| No. | Particulars of Item | Unit | Quantity | Unit Rate (INR) | Amount (INR) |
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| **Total** | | | | | **xxx** |

# Quantity Calculations for Rehabilitation of Aqueduct _ LMC

Name of the Sub-project: Rehabilitation of West Banas Irrigation Sub-project
District: Sirohi District
Type of the Works: Rehabilitation of LMC System _ Left Main Canal
Reference Drawing: Drawing no.....

| No. | Particulars of Item | Unit | No | L | B | H/D | Qty. |
|---|---|---|---|---|---|---|---|
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# Abstract of Cost for Rehabilitation of Siphon _ LMC

Name of the Sub-project: Rehabilitation of West Banas Irrigation Sub-project
District: Sirohi District
Type of the Works: Rehabilitation of LMC System _ Left Main Canal
Reference Drawing: Drawing no.....

| No. | Particulars of Item | Unit | Quantity | Unit Rate (INR) | Amount (INR) |
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| **Total** | | | | | **xxx** |

# Quantity Calculations for Rehabilitation of Siphon _ LMC

Name of the Sub-project: Rehabilitation of West Banas Irrigation Sub-project
District: Sirohi District
Type of the Works: Rehabilitation of LMC System _ Left Main Canal
Reference Drawing: Drawing no.....

| No. | Particulars of Item | Unit | No | L | B | H/D | Qty. |
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# Abstract of Cost for Rehabilitation of Falls _ LMC

Name of the Sub-project: Rehabilitation of West Banas Irrigation Sub-project
District: Sirohi District
Type of the Works: Rehabilitation of LMC System _ Left Main Canal
Reference Drawing: Drawing no.....

| No. | Particulars of Item | Unit | Quantity | Unit Rate (INR) | Amount (INR) |
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| **Total** | | | | | **xxx** |

# Quantity Calculations for Rehabilitation of Falls _ LMC

Name of the Sub-project: Rehabilitation of West Banas Irrigation Sub-project
District: Sirohi District
Type of the Works: Rehabilitation of LMC System _ Left Main Canal
Reference Drawing: Drawing no.....

| No. | Particulars of Item | Unit | No | L | B | H/D | Qty. |
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# Abstract of Cost for Rehabilitation of VRBs _ LMC

Name of the Sub-project: Rehabilitation of West Banas Irrigation Sub-project
District: Sirohi District
Type of the Works: Rehabilitation of LMC System _ Left Main Canal
Reference Drawing: Drawing no.....

| No. | Particulars of Item | Unit | Quantity | Unit Rate (INR) | Amount (INR) |
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| **Total** | | | | | **xxx** |

# Quantity Calculations for Rehabilitation of VRBs _ LMC

Name of the Sub-project: Rehabilitation of West Banas Irrigation Sub-project
District: Sirohi District
Type of the Works: Rehabilitation of LMC System _ Left Main Canal
Reference Drawing: Drawing no.....

| No. | Particulars of Item | Unit | No | L | B | H/D | Qty. |
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# Abstract of Cost for Rehabilitation of Outlets _ LMC

Name of the Sub-project: Rehabilitation of West Banas Irrigation Sub-project
District: Sirohi District
Type of the Works: Rehabilitation of LMC System _ Left Main Canal
Reference Drawing: Drawing no.....

| No. | Particulars of Item | Unit | Quantity | Unit Rate (INR) | Amount (INR) |
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| **Total** | | | | | **xxx** |

# Quantity Calculations for Rehabilitation of Outlets _ LMC

Name of the Sub-project: Rehabilitation of West Banas Irrigation Sub-project
District: Sirohi District
Type of the Works: Rehabilitation of LMC System _ Left Main Canal
Reference Drawing: Drawing no.....

| No. | Particulars of Item | Unit | No | L | B | H/D | Qty. |
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# Abstract of Cost for Rehabilitation of Existing Canal Lining _ Minor Canals _ LMC

Name of the Sub-project: Rehabilitation of West Banas Irrigation Sub-project
District: Sirohi District
Type of the Works: Rehabilitation of LMC System _ Minor Canals
Reference Drawing: Drawing no.....

| No. | Particulars of Item | Unit | Quantity | Unit Rate (INR) | Amount (INR) |
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| **Total** | | | | | **xxx** |

# Quantity Calculations for Rehabilitation of Existing Canal Lining _ Minor Canals _ LMC

Name of the Sub-project: Rehabilitation of West Banas Irrigation Sub-project
District: Sirohi District
Type of the Works: Rehabilitation of LMC System _ Minor Canals
Reference Drawing: Drawing no.....

| No. | Particulars of Item | Unit | No | L | B | H/D | Qty. |
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# Abstract of Cost for Provision of Measuring Devices _ Minor Canals _ LMC

Name of the Sub-project: Rehabilitation of West Banas Irrigation Sub-project
District: Sirohi District
Type of the Works: Rehabilitation of LMC System _ Minor Canals
Reference Drawing: Drawing no.....

| No. | Particulars of Item | Unit | Quantity | Unit Rate (INR) | Amount (INR) |
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| **Total** | | | | | **xxx** |

# Quantity Calculations for Provision of Measuring Devices _ Minor Canals _ LMC

Name of the Sub-project: Rehabilitation of West Banas Irrigation Sub-project
District: Sirohi District
Type of the Works: Rehabilitation of LMC System _ Minor Canals
Reference Drawing: Drawing no.....

| No. | Particulars of Item | Unit | No | L | B | H/D | Qty. |
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# Abstract of Cost for Rehabilitation of Aqueduct _ Minor Canals _ LMC

Name of the Sub-project: Rehabilitation of West Banas Irrigation Sub-project
District: Sirohi District
Type of the Works: Rehabilitation of LMC System _ Minor Canals
Reference Drawing: Drawing no.....

| No. | Particulars of Item | Unit | Quantity | Unit Rate (INR) | Amount (INR) |
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| **Total** | | | | | **xxx** |

# Quantity Calculations for Rehabilitation of Aqueduct _ Minor Canals _ LMC

Name of the Sub-project: Rehabilitation of West Banas Irrigation Sub-project
District: Sirohi District
Type of the Works: Rehabilitation of LMC System _ Minor Canals
Reference Drawing: Drawing no.....

| No. | Particulars of Item | Unit | No | L | B | H/D | Qty. |
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# Abstract of Cost for Rehabilitation of Siphon _ Minor Canals _ LMC

Name of the Sub-project: Rehabilitation of West Banas Irrigation Sub-project
District: Sirohi District
Type of the Works: Rehabilitation of LMC System _ Minor Canals
Reference Drawing: Drawing no.....

| No. | Particulars of Item | Unit | Quantity | Unit Rate (INR) | Amount (INR) |
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| **Total** | | | | | **xxx** |

# Quantity Calculations for Rehabilitation of Siphon _ Minor Canals _ LMC

Name of the Sub-project: Rehabilitation of West Banas Irrigation Sub-project
District: Sirohi District
Type of the Works: Rehabilitation of LMC System _ Minor Canals
Reference Drawing: Drawing no.....

| No. | Particulars of Item | Unit | No | L | B | H/D | Qty. |
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# Abstract of Cost for Rehabilitation of Falls _ Minor Canals _ LMC

Name of the Sub-project: Rehabilitation of West Banas Irrigation Sub-project
District: Sirohi District
Type of the Works: Rehabilitation of LMC System _ Minor Canals
Reference Drawing: Drawing no.....

| No. | Particulars of Item | Unit | Quantity | Unit Rate (INR) | Amount (INR) |
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| **Total** | | | | | **xxx** |

# Quantity Calculations for Rehabilitation of Falls _ Minor Canals _ LMC

Name of the Sub-project: Rehabilitation of West Banas Irrigation Sub-project
District: Sirohi District
Type of the Works: Rehabilitation of LMC System _ Minor Canals
Reference Drawing: Drawing no.....

| No. | Particulars of Item | Unit | No | L | B | H/D | Qty. |
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# Abstract of Cost for Rehabilitation of VRBs _ Minor Canals _ LMC

Name of the Sub-project: Rehabilitation of West Banas Irrigation Sub-project
District: Sirohi District
Type of the Works: Rehabilitation of LMC System _ Minor Canals
Reference Drawing: Drawing no.....

| No. | Particulars of Item | Unit | Quantity | Unit Rate (INR) | Amount (INR) |
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| **Total** | | | | | **xxx** |

# Quantity Calculations for Rehabilitation of VRBs _ Minor Canals _ LMC

Name of the Sub-project: Rehabilitation of West Banas Irrigation Sub-project
District: Sirohi District
Type of the Works: Rehabilitation of LMC System _ Minor Canals
Reference Drawing: Drawing no.....

| No. | Particulars of Item | Unit | No | L | B | H/D | Qty. |
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# Abstract of Cost for Rehabilitation of Outlets _ Minor Canals _ LMC

Name of the Sub-project: Rehabilitation of West Banas Irrigation Sub-project
District: Sirohi District
Type of the Works: Rehabilitation of LMC System _ Minor Canals
Reference Drawing: Drawing no.....

| No. | Particulars of Item | Unit | Quantity | Unit Rate (INR) | Amount (INR) |
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| **Total** | | | | | **xxx** |

# Quantity Calculations for Rehabilitation of Outlets _ Minor Canals _ LMC

Name of the Sub-project: Rehabilitation of West Banas Irrigation Sub-project
District: Sirohi District
Type of the Works: Rehabilitation of LMC System _ Minor Canals
Reference Drawing: Drawing no.....

| No. | Particulars of Item | Unit | No | L | B | H/D | Qty. |
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# Abstract of Cost for Promotion of Micro Irrigation System

Name of the Sub-project: Rehabilitation of West Banas Irrigation Sub-project
District: Sirohi District
Type of the Works: Promotion of Micro Irrigation System
Reference Drawing: Drawing no.....

| No. | Particulars of Item | Unit | Quantity | Unit Rate (INR) | Amount (INR) |
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| **Total** | | | | | **xxx** |

# Quantity Calculations for Promotion of Micro Irrigation System

Name of the Sub-project: Rehabilitation of West Banas Irrigation Sub-project
District: Sirohi District
Type of the Works: Promotion of Micro Irrigation System
Reference Drawing: Drawing no.....

| No. | Particulars of Item | Unit | No | L | B | H/D | Qty. |
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# Abstract of Cost for Construction of WUA Facilities

Name of the Sub-project: Rehabilitation of West Banas Irrigation Sub-project
District: Sirohi District
Type of the Works: Construction of WUA Facilities
Reference Drawing: Drawing no.....

| No. | Particulars of Item | Unit | Quantity | Unit Rate (INR) | Amount (INR) |
|---|---|---|---|---|---|
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| **Total** | | | | | **xxx** |

# Quantity Calculations for Construction of WUA Facilities

Name of the Sub-project: Rehabilitation of West Banas Irrigation Sub-project
District: Sirohi District
Type of the Works: Construction of WUA Facilities
Reference Drawing: Drawing no.....

| No. | Particulars of Item | Unit | No | L | B | H/D | Qty. |
|---|---|---|---|---|---|---|---|
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# Abstract of Cost for Gender Mainstreaming Activities

Name of the Sub-project: Rehabilitation of West Banas Irrigation Sub-project
District: Sirohi District
Type of the Works: Gender Mainstreaming Activities
Reference Drawing: Drawing no.....

| No. | Particulars of Item | Unit | Quantity | Unit Rate (INR) | Amount (INR) |
|---|---|---|---|---|---|
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| **Total** | | | | | **xxx** |

# Quantity Calculations for Gender Mainstreaming Activities

Name of the Sub-project: Rehabilitation of West Banas Irrigation Sub-project
District: Sirohi District
Type of the Works: Gender Mainstreaming Activities
Reference Drawing: Drawing no.....

| No. | Particulars of Item | Unit | No | L | B | H/D | Qty. |
|---|---|---|---|---|---|---|---|
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**Water Resource Department (WRD),**
**The State of Rajasthan, Republic of India**

# DETAILED PROJECT REPORT
# ON
# REHABILITATION OF WEST BANAS IRRIGATION SUB-PROJECT

# Volume-3:DRAWINGS

**August 2016**

**Rajasthan Water Sector Livelihood Improvement Project (RWSLIP)**

**Sub-PMU 3 for Udaipur and Jodhpur Zones**

# List of Drawings

| Plate No. | Title of Drawing |
|---|---|
| **General** | |
| | General Layout of West Banas Irrigation System |
| | Schematic Diagram of West Banas Irrigation System |
| | Schematic Diagram of Structure |
| | Schematic Diagram of Water Level |
| | Bench Mark Network |
| **West Banas Dam** | |
| | General Layout of West Bans Dam |
| | Submergence Map of West Banas Dam |
| | General Plan of West Banas Dam |
| | Longitudinal Profile of Dam Body |
| | Cross Sections of Dam Body |
| | Typical Cross Section of Rehabilitation of Dam Body |
| | Details of Rehabilitation of Embankment |
| | Details of Repair of Riprap |
| | Details of Provision of Quarry Spalls |
| | Repair of Intake Structure |
| | Typical Drawings for Sluice Gates |
| | Rehabilitation of Spillway |
| | Details of Provision of Filter Toe |
| **Right Main Canal** | |
| | Longitudinal and Cross Sections |
| | Typical Cross Section for Canal Lining works |
| **Left Main Canal** | |
| | Longitudinal and Cross Sections |
| | Typical Cross Section for Canal Lining works |
| **Fula Bai Ka Khera Minor Canal** | |
| | Longitudinal and Cross Sections |
| | Typical Cross Section for Canal Lining works |
| **Sangwara Minor Canal** | |
| | Longitudinal and Cross Sections |
| | Typical Cross Section for Canal Lining works |
| **Achpura Minor Canal** | |
| | Longitudinal and Cross Sections |
| | Typical Cross Section for Canal Lining works |
| **Mungthala Minor Canal** | |
| | Longitudinal and Cross Sections |
| | Typical Cross Section for Canal Lining works |
| **Kyaria Minor Canal** | |
| | Longitudinal and Cross Sections |
| | Typical Cross Section for Canal Lining works |
| **Canal Related Structures** | |
| | Details of Provision of Measuring Devices |
| | Details of Rehabilitation of Aqueduct |
| | Details of Rehabilitation of Siphon |
| | Details of Rehabilitation of Falls |
| | Details of Rehabilitation of VRBs |
| | Details of Replacement of Outlets |

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| **Promotion of Micro Irrigation System** | |
| | Typical Drawings for Community Based Sprinkler Irrigation System |
| | Typical Drawings for Individual Farmer Based Drip Irrigation System |
| **Construction of WUA Facilities** | |
| | Details of WUA Facilities (xxxxxxxxxxxxxx) |
| **Support for Gender Mainstreaming Activities** | |
| | Details of Women Friendly Facilities (xxxxxxxxxxxxxxxx) |
| | Location of Women Friendly Trees (xxxxxxxxxxxxxxxx) |

*(Please insert at least the above drawings )*

# *Attachment 4.6*
# *Long List of the Candidate Irrigation Sub-projects for RWSLIP*

# *Attachment 4.7*
# *Short List of the Candidate Irrigation Sub-projects under RWSLIP*

# *Attachment 4.8*
# *Screening and Scoring Sheet for Selection of the Candidate Irrigation Sub-projects under RWSLIP*

# *Attachment 4.9*
# *Short List of Candidate Irrigation Sub-projects for RWSLIP*
# *(82 Sub-projects, for Project Formulation)*