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| **Baseline study for Fisheries Development in Telangana state** | | | |
| **Suggested frame for work plan** | | | |
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| **Title of Task as per TOR** | **Sub tasks** | Suggested Work plan | |
| ***Baseline Assessment of water body resources***  ***Development of resource data base***  ***Estimation of fishery resource productivity & production potentials of different resources***  ***Comparative evaluation of Departmental tanks and Gram Panchayat tanks which are linked to societies and tanks which are not linked to societies.***  ***Use of non conventional water bodies viz., fish ponds constructed under NREGA, NHM, etc for their suitability and linkages required to explore for development of fisheries and aquaculture.***  ***Explore feasibility for pursuing new activities***  ***Stocking policies, and such other aspects***  ***Suggest appropriate measures/ strategies for enhancing fish production in a sustained way through culture-based fisheries, conservation and propagation of native species.*** | ***Study present status of water bodies in selected study districts***  **a. *Assessing water resources – water bodies quantification, geographical distribution, characterization, mapping, development of data base***  **b. *Assessing resource status & potentials – bio-physical parameters (abiotic and biotic) of selected reservoirs and tanks, assessment of fish stock***    ***Fish Stock assessment, Gear-fisher history-fishing effort, gears and craft used and such other aspects***  ***Habitat quality - species composition, species richness, diversity***  ***Spatial and temporal abundance and distribution of fisheries stocks*** | *Collection of available secondary data on water bodies (location wise) and related information from Department of fisheries and other institutions viz. Minor Irrigation Department, Zilla Parishad / Village Panchayat, watershed etc for the purpose of resource mapping*  *Complementing resource mapping with satellite data (high resolution satellite imageries ground tuthed with geographic positioning system (GPS) for pre and post monsoon period 2016-17) if made available freely by the DOF, GOT from Govt. institutions/ organizations (CIFRI/National Remote Sensing Agency (NRSA), Hyderabad/ State Remote Sensing Application Centres etc.) who are routinely involved in national resource mapping studies*  *Processing /classification of images based on spectral signatures using GIS software remote sensing imageries (GIS) and ground truthing for hydro-biological features, ownership etc*  *Preparation of base maps using topo-sheets*  *Data analysis and Development of attributes tables – area, water holding, seasonality, production etc for the district and accordingly development of GIS maps* | |
| *Visit to selected resources (tanks & reservoirs)-Collection of required samples by field investigators for bio-physical parameters : water quality, analysis in designated laboratory / R&D centers for primary parameters viz., biotic community- Phyto and zoo plankton; macro-benthos, macrophytes etc density and composition, also water quality parameters*  *Collection of primary data on morphometrics viz., area, mean depth, flushing ratio, reservoir area to catchment area; habitat characteristics;, - collected / accessed through different sources viz.,, Irrigation dept., DOF, R&D institutions and others*  *Collection of secondary data if available on water quality (temp. Sechi disc transparency, pH, vertical profile of DO, pH, alkalinity/ conductivity) and biotic communities of these resources from R&D institutions and others; consulting related publications and reports; Validation through visits by enumerators using structured schedules, enquiry of stakeholders, FGD’s……..*  *Biological productivity - climatic, edaphic (drainage area, rate of erosion, total runoff & nutrient loading- flushing rate viz., inflow/storage capacity; basin morphometric features-catchment & its activities, area of reservoir at FRL(C/A); mean and max.depth (volume development index); shore development index (shore length and reservoir area); Morphoedaphic index (TDS/mean depth); Morphodrainage Index((C/A)/mean depth); Limno- chemical Analysis of water for chemical parameters –pH, DO, CO2,total alkalinity, TDS , specific conductivity, calcium, phosphates, nitrates; Est.of phytoplankton primary productivity-light and dark botttle method; Categorization as oligotrophic, meso and eutrophic.*  *Assessment of Fish Stock: Field survey -Field sampling to execute experimental fishing- fish assemblage ( operating multi-meshed nets in reservoirs and by selective fishing in tanks)*  *Gear-fisher inventory- Survey of landed fish at principal and secondary landing areas- focus on catch composition, locations of fishing, sizes of catch, catch volume and fishing effort- analysis of CPUE, sizes of catch, catch composition*  *Type and varieties of self-populating fish species and stocked fish species in catch, % share; Fishing effort-gears and craft used, seasonality and other aspects; Stocking policies viz., species, stocking density, size of seed, time and periodicity of stocking*  *Analyzing catch composition in the landing centers and market arrivals from the water bodies. Desk based analysis : assessing productivity potentials Predict potential fish yield; Propose strategies for enhancing fish production, conservation and propagation of native and endemic species* | |
| *Study existing aquaculture production systems- tank fish culture, commercial pond aqua culture, input/feed based farming, integrated farming, ornamental fish farming…*  *Study feasibility of Pen and cage culture for fish farming /fish fattening /seed rearing in reservoirs and large water bodies-* | Estimation of *productivity &* production potentials of different water bodies and fish farming system  *Assessment of aquaculture potentials of water bodies developed under various supportive programs of Govt. including Mission Kakatiya and such others*  *Feasibility of Pen and cage fish farming/seed rearing in reservoirs and large water bodies* | *Carry out multi-location study visiting diversified natural tank resources, newly constructed water bodies developed under various supportive programs of Govt. including Mission Kakatiya and such others aquaculture production systems viz., tank fish culture, commercial pond aqua culture, input/feed based farming, integrated farming, ornamental fish farming…in sampling districts*  *Document resource characteristics - water source, seasonality, soil types, seepage and water retention, species stocked vis a vis the duration of water availability*  *Document different farming systems, technologies / approaches in adoption/ in practice wrt. Old and new developed water bodies; Fish production/ha; growth performance of species, share to total fish production, resource productivity, economic traits and other parameters etc from the perspective of promoting technology led aquaculture to enhance resource productivity and production- interviews, discussions, FGD, observations & interactions ;Review Backward and forward support system- available under the changed practice and explore scope for positioning new system and suitable strategies to address Seed Replacement Rate etc.- secondary data, field observations, desk based analysis*  *Visit to reservoirs and large water bodies in selected districts, study resource characters*  *Assess resource feasibility for undertaking pen and cage culture --morphometric characteristics- land topography, catchment activities, threat of industry effluents, rain fall pattern, seasonality, intensity, bio protection to the sites, water depth to support erection of cages/pens, availability of natural coves in the water bodies to fix pens in support of fish seed rearing lasting 2-3 months, raising fingerlings during monsoon and early post-monsoon and also for fish culture/fish fattening.*  *Examine suitability of sites e for erecting of cages/ pens, support system*  *Organize exclusive FGD’s with interest groups, interaction with fishers, FCS and others , document their perception , interest and participatory sharing; review status of support system existing and needed*  *Interaction with officers of Fisheries Departments, R&D institutions, organizations involved in similar such studies*  *Document community involvement, perceptions, trends in investment in cage/pen culture, technology use and its efficiency, productivity and profitability of individual / group enterprises*  *Analysis of data, Assessment of aquaculture potentials of water bodies Document type of cages/pens, number and type, fish species, input, Fish production/unit size; performance of Fish seed rearing, seed survival, economic viability, Cost Economics of farming; Support system group enterprises*  *Analysis of data, Assessment of aquaculture potentials of water bodies Document type of cages/pens, number and type, fish species, input, Fish production/unit size; performance of Fish seed rearing, seed survival, economic viability, Cost Economics of farming; Support system …* | |
| *Study status of fish seed rearing in land based infrastructure, feasibility for seed rearing - seasonal tanks, non conventional water bodies, peripheral tanks, in situ rearing*  Review Development plans for seed production to meet present and future demand .*Suggest strategies to* meet present and future demand | *Present status of ongoing fish seed production & rearing – performance of hatcheires (Govt.& private)*  *seed rearing in seasonal tanks, non conventional water bodies, peripheral tanks, in situ rearing*  Development plans for seed production | *Performance of hatcheries (Govt.& private), Seed rearing under govt. & private sector*  *Seed rearing in seasonal tanks, non conventional water bodies, peripheral tanks, in situ rearing….Production technologies, performance of support services, State Develop Plans for enhancing seed production*  *Mapping fish seed chain - seed production/ procurement (spawn, fry/ fingerlings), seed rearing activity; species used and present practice for stocking natural resources and commercial aquaculture etc. ; and document present status of fish seed chain the state including Distribution channels, marketing, quality, certification, economics of activity*  *Collection of secondary data available/ published ; Visits to selected govt. and private owned fish seed production hatcheries and rearing centres- Review their installed capacity and extent of utilisation, operational protocols, performance , constraints*  *Interaction with officers - Fisheries Departments, R&D institutions, pvt. Fish seed growers, Seed suppliers, input dealers, individuals/ organizations involved in similar such activities*  *Study feasibility of in situ fish seed rearing in the catchment of reservoirs and tanks, small water bodies (govt./ private), non conventional resources etc., Peripheral tanks surrounding reservoirs/ tank water bodies, natural ponds/ pools within reservoirs/ perennial tanks, catchment etc, rearing of advanced fingerlings*  *Assess brood stock management and breeding practices followed in seed production centers; Analyse gap between requirement and production*  *Study status of infrastructure; Review on going Development plans for seed production*  *Study status and suggest strategies for quality fish seed production of carps and other cultivable species, new candidate species viz.,murrel, Nile/Gift Tilapia, Amur common carp, Pangasius, scampi, ornamental fish and indigenous fishes for self sustenance* | |
| *Assessment of market potential, scope and opportunities for exports and imports*  *Assessment of domestic fish marketing*  *Mode of functioning, pattern of ownership, revenue collection, market information system (MIS); alternative marketing system, infra structure including new markets developed with funding of NFDB and others*  *Document information on legislations covering fish marketing, applicability of agricultural market legislations, problems in implementation of rules governing existing legislations*  *Study on Infrastructure needs – identify existing gaps in entire production, distribution, marketing and value chain*  *Feasibility for development of additional infrastructure like ice factory, chilled rooms, dressing centres, landing centers, auction halls and storage facilities….* | *Status and potentials of existing fish Markets- domestic market, trends, consumption, demand & supply, consumption patterns, share of domestic production, processing & value addition*  *Scope and opportunities for exports and imports*  *Market potential,* Mode of functioning, Market information system (MIS)  Document information on legislations covering fish marketing; Infrastructure, alternative marketing system,  Guide lines / legislation  *Domestic fish marketing-trends*  *consumption, demand & supply,*  *consumption patterns, share of domestic production, processing & value addition*  *Inventory of infrastructure*  *Status of Infrastructure for sector related activities*  *Existing infra structure gaps in entire production, distribution, marketing and value chain*  *Identify need for additional infrastructure -ice factory, chilled rooms, dressing centres, landing centers, auction halls and storage facilities….* | *Collection of secondary data on existing fish markets, mode of functioning, alternative marketing system such as contract farming, group marketing and other formats pattern of ownership, revenue collection, market information system (MIS), infrastructure, legislations covering fish marketing, applicability of agricultural market legislations from DOF and others involved*  *Collection of Primary information in the selected study districts - sample survey approach through structured schedules and site visits*  *Organizing stakeholders meet and interactions;Field visits to different selected markets in sampling districts (Municipality market, retail & whole sale markets…)*  *Feed back on problems in implementation of the rules governing existing legislations, available study reports related to markets and marketing, legislations governing fish markets and cooperatives ; Discussions/Interactions with stakeholders (farmers, intermediaries ,traders, agents, traders associations, fish suppliers, dealers, market officials if any, DOF officers and others) on issues related to Licensing system of harvesters, traders and other market functionaries, need for improvement/ additional /new market infra cooperatives and institutional arrangements for fish marketing, scope for collective Marketing through cooperatives/producer companies/public-private partnership, implementation of provisions market legislations*  *Mapping of market functionaries (viz., traders, assemblers ,commission agents, transporters, small-scale processors, commercial utilizers, consumers …)*  *Mapping Marketing channels and price spread*  *Supply chain management with and without intervention of state*  *Collection of secondary data from DOF and other concerned on details existing macro infrastructure at the district levels- status of hatchery, seed rearing farms, fish landing centers at reservoirs and major tanks, rivers etc., on-site fish holding & packaging facilities, ice factories, pickup vans and other mode of fish transportation vehicles, marketing centers, auction halls, Dressing units , waste handling, modern hygienic markets, cold storage, cold chain, net/ boat making units, feed mill, processing and value addition units etc. if any*  *Collection of Primary information on infra structure facilities available, status of functioning, utilization, needs etc. in the selected study districts - sample survey approach through structured schedules and site visits.*  *Visit to selected fish landing centers, auction halls and storage facilities- document available infrastructure to handle the present fish arrivals, also collect information related to daily fish catch, species composition, seasonality, number of fishers involved and fishing efforts*  *Organize FGDs with Fishermen societies / groups of fishermen/ other stakeholders involved in different activities of the supply and value chain in different locations to elicit information*  *Collection of information from DOF and other stakeholders through personnel interview/ through exclusive schedules on perception on*  *A. establishment of new landing centers/ reallocation and improvements to existing once and such others*  *B. perception, plans, rationale for establishment of new infrastructure- brood banks, hatcheries, seed production and rearing farms under public and private ownership, seed multiplication centers, captive nurseries adjacent to large tanks and reservoirs, seed banks, establishment of scampi hatcheries, Construction of fish ponds/tanks in Gram Panchayat, aquaculture farms, clusters, estates, hubs, corridors, parks etc., feed mills, cold chain, live fish transportation, hygiene markets, fish markets in municipalities, integrated marketing kiosks, Integrated processing & value addition units, aqua labs and mobile labs for soil & water testing and diagnostic, one-stop-shops, State-of-art Training centers, Fish farmer training centres on zonal/regional basis etc* | |
| *Study functioning of cooperative societies -roles and performance, process and mechanisms, issues, problem and constraints*  *Review functioning of other local institutions - SHGs, farmers groups*  *Suggest strategies for strengthening of Fishermen cooperative societies* | *Functioning of Fishermen cooperative societies*  *Roles and performance of members and executives*  *Process and mechanisms, issues, problem and constraints*  *Registration of new FCS, membership enrolment, enhancement of membership*  *functioning of other local institutions - SHGs, farmers groups*  *Organizing fishers to come together and function better….* | *Collection of secondary information on Details of FCS and other local institutions in support of sector related activities form DOF, Federation and other concerned*  *Collection of Primary information in the selected study districts - sample survey approach through structured schedules and site visits*  *Organizing FGD’s and interaction with members and executives of FCS*  *Collection of information on roles and responsibilities of members, organic linkages of members with FCS executives, institutional support of FCS to members, benefit sharing pattern to make FCS self sustained, economic performance and accountability of FCS, conflict resolution mechanisms, linkages and support of Federation and DOF to FCS and intern to members, support of other line departments,*  *Mapping perceptions on key issues/ problems, causes and constraints, reasons for their poor performance/non-performance, mechanisms for organizing fishers to come together and function better, perceptions on means and mechanisms, institutional roles and responsibilities in implementation etc for better and viable performance with increased return/unit effort and better community benefits,..*  *Field visits to different activity sites in sampling districts – landing centers, on- site marketing units,*  *Interaction with DOF officers and Federation on roles and responsibilities, programs, capacity building , liaison/facilitative activities- inputs, credit , insurance, welfare programs etc, monitoring, record keeping, election, benefits sharing and ensure equity in resource allocations etc..* | |
| *Review status of HR at HQ and field level for implementing planned activities- identify the gaps, also at all levels of supply and value chain*  *Review Capacity Development of HR at all levels - related trainings & hand holding*  *Mapping of extension and training institutions, facilities and linkages with existing institutions for dissemination and diffusion – FCS, MMG’s &SHG’s, KVK’s, SAU’s, others….*  *Suggestions for appropriate extension and training facilities & linkages with institutions* | *Status of HR at HQ and field level, No. of technical, supporting and admin at HQ and field level,*  *HR related gaps- no., gender, age groups, education, skill, capabilities, performance…*  *Assessment of manpower requirement at HQ and field*  *Trainings & hand holding activities*  *other extension and dissemination activities*  *institutions, infrastructure and linkages*  *Gaps and feed back, Stakeholders needs* | *Collection of secondary data on organisation set up - roles and responsibilities of personnel at head office, district and field levels of Fisheries Department*  *Existing manpower strength (Technical, supportive, admin etc.) both at Head Quarters ( State & District) and field level*  *Information on various institutions imparting fisheries related services, extension programs/ activities on wide ranging fisheries activities and HR related trainings & Capacity building, Skill development organized to farmers and other stakeholders of the sector over a period of 5 years by DOF and others*  *Exclusive Interaction of Experts with DOF staff functioning at different levels and also with other institutional extension functionaries to collect inputs/opinion on effectiveness of the present set up in carrying out various tasks related to fisheries growth, shortcomings and scope for improvement including improved delivery of these programs, HR related Gaps in the system and need for re-organising (structural and functional) and revamping of the DOF to meet emerging challenges*  *Organizing FGD’s and interaction with fish farmers, members and executives of FCS and other stake holders- collection of information on perceptions /feedback on trainings, other extension activities, service delivery of various schemes and programs, handholding support in implementation, linking them to benefits of welfare programs of other line departments/ agencies including credit and insurance etc.*  *Institutional mapping & arrangements in support services for different segments* | |
| *Review GOTS policies on resource allocation, cage/pen culture, contours of various schemes and programs*  *Review guidelines & policies of GOT related to sector development initiatives, community welfare, disaster & risks, insurance and others- also interventions of other line depts.*  *Study feasibility of policy changes to aid / assist and create an enabling environment in sector* | *Efficacy of present leasing/ licensing system*  *Scope for expansion-horizontal and vertical- of cage in the state and hand holding support available and required*  *Suggest Priority areas of investment*  *Strategies in practice to mitigate issues related to climate, disaster & risks, insurance, environ. and ecological sustainability*  *Suggest changes/policies needed for disposal of fishery wealth, empower fishing communities* | *Collection of secondary data from DOF and others concerned to on-going policies in practice to mitigate constraints related to sector supply and value chain viz., resource access (lease/licensing), expansion (horizontal and vertical)of cage in the state and hand holding support, available and required ongoing schemes / programs/ interventions of DOF and other line departments in support of input support to community, fishers’ welfare*  *Collection of information on fish seed policy if any, regulating seed import from other states, to address quality issues; policy for promotion of cage/pen fish farming in selected reservoirs and large perennial water bodies, budgetary policy of the GOT and trends in allocation of resources to the Fisheries sector and identify gaps*  *Collection of information on HRD policy (changes/new policies) needed to empower DOF, fishing communities and other stakeholders*  *Policy related to river ranching and other conservation measures for enhancement of riverine fisheries, status of conservation measures like mesh size and close season, ban on exotic fishes that are detrimental to the local fauna, policy/guidelines on Eco-tourism and sports fishery*  *Exclusive Interaction of Experts with DOF staff and other relevant stakeholders where ever required to seek opinion/feed back/validate information related to private participation, priority areas of investment, credit & insurance to cover risks and unforeseen, Socio - economic issues of fishers*  *Carry out an analytical studies, Identify existing lacunae* | |
| *Assessment socio - economic issues of fishers and others involved in fisheries and aquaculture activities*  *Suggest appropriate mitigating strategies to restore / protect both environmental and ecological sustainability* | *strategies in practice for attaining environmental and ecological sustainability*  *Strategies to mitigate issues related to climate, constraints related to production system, institutional and policy issues etc* | *Carry out detailed interaction with key stakeholders -involved in fisheries and aquaculture supply and value chain-production, harvest and post harvest, distribution, marketing and value addition activities and map critical points responsible for adverse impact on ecology and environment*  *Identify areas /practices/ process that need attention (viz., intensification of farming activities, self pollution, waste water discharge with higher levels of organic matter, N& P nutrients, bio stats and biocides etc, altering the natural eco system, its food chain and system service potential at different levels*  *Study various aspects of stocking of natural water bodies with fish species not recommended for the ecosystem ex. stocking big heads, silver carp to reservoirs, tilapia, African catfish etc to tanks*  *Document resource degradation associated to intensive aquaculture and such others- negative impact of illegal farming of alien fish species that are not compatible with natural biodiversity of water bodies and native fish species that are self populating and formed natural fisheries, their accidental / intentional entry in to natural ecosystem, fish escape from cages due to net damages, high wind actions, floods, social related problems and other unforeseen* | |