**TERMS OF REFERENCE FOR**

**CONDUCTING BASELINE STUDY FOR FISHERIES DEVELOPMENT IN TELANGANA STATE**

**1. Title:** Baseline study for Fisheries Development in Telangana state

**2. Background and context:**

Fisheries and aquaculture is regarded as one of the important sectors of the state economy (with an estimated share of 0.6% and 3.47% of agriculture GSDP during 2014-15 at current prices) contributing considerably for food security, nutrition and health, livelihood security to rural population and welfare of fishers. The sector has immense scope for development and contribution to the growth, and has made rapid strides in recent years. In the absence of coastal line, the state is exclusively dependent on inland water bodies to meet its fish production demands.

The water bodies of the state are vast and diverse, and tanks and reservoirs form the major focus of fisheries and aquaculture development. Of late, a few of the segments in the sector have emerged as important commercial activities from its traditional role as subsistence supplementary activity and could throw out wider opportunities to stimulate growth of a number of subsidiary activities. The sector is also supporting generation of additional employment and income to a large number of rural households involved/assisting the activities viz., fish seed production, harvesting, net and boat making, transportation and distribution, marketing and such others related to entire supply chain.

The state is making efforts to bring in sustainable growth to sector with **key objectives** of

* Judicious use of available water resources for sustained fish production
* Enhancement of resource productivity and fish production
* Providing nutritional security, economic prosperity, and gainful employment and step up social status of those involved

Considering the future development of sector on sustainable pathways, profiling of sector, baseline/benchmark survey of resources, stock enhancement and farming practices, positioning of appropriate support systems, strengthening of institutional arrangements and networking, pro sector schemes/programs and policies to promote fisheries and aquaculture are the felt need of hour to build a new landscape for sector growth in the state.

In this backdrop, the Government of Telangana State intends to enhance the sector growth in an accelerated manner and has identified some key areas that need to be addressed in a holistic way. The Commissioner for Fisheries, Government of Telangana vide letter no.2560/C1/2014, dated 19-2-2016 had requested AFC India Ltd. (Formerly Agricultural Finance Corporation Ltd.) - AFC, Northern Regional Office, New Delhi to assist Government of Telangana in conducting baseline study for fisheries development in the state by focusing on (a) resource status assessment, fish stock assessment, estimation of production potentials of water bodies; feasibility for pursuing new activities, (b) resource specific species diversity for fish farming and promotion of aquaculture; feasibility of cage and pen culture in reservoirs and tanks for fish seed rearing/fish culture, (c) infrastructure needs, (d) HR development and requirement at different levels, strengthening of existing supportive institutions, (e) policies and programs related to disposal of fishery wealth, resource access to community and others, (f) private participation and investment in sector related activities, (g) environmental and ecological sustainability, and (h) assessment of socio- economic issues etc with an objective of boosting production and productivity of water bodies, harnessing natural resources to optimum level and achieve overall growth of sector. Accordingly AFCL Submitted Technical (attachment 1 for details) and Financial Proposal with scope of the study and Broad Terms of Reference on 30th March, 2016, also made power point presentations to the Commissioner for Fisheries, GOT and senior Officers of DOF staff on 26th May,2016 and on 23rd July, 2016.

Subsequently in the recent Brainstorming workshop on Comprehensive Development of Fisheries and Aquaculture in Telangana: Way Forward organized by Govt. of Telengana on 16-17th February, 2017, certain additional issues viz., seed production in the State to meet the present and future demand, study of fish markets and marketing (market potential, consumption patterns, processing and value addition), functioning of Fishermen Cooperative Societies were identified to be addressed in baseline studies to achieve fisheries sector growth. The Govt. of Telangana hence suggested some additional areas to be incorporated in the study. Accordingly, the TOR was modified incorporating the newly suggested points. The proposal was submitted to the Government by the Commissioner for approval and engaging the services of AFC for conducting this study. The Govt. of Telangana has accorded approval to the proposal and authorized the Commissioner for Fisheries, GoT to engage the services of AFCL, Mumbai for the study as per order no. G.O.Rt.No. 53 dated 12-04-2017.

The overall baseline study assignment will be executed and coordinated by the AFCL as consultancy agency to which the assignment has been entrusted.

**The Broad tasks for the study are**

* ***Baseline Assessment of water body resources -*** *Study present status of water bodies in selected study districts; study abiotic and biotic parameters of selected reservoirs and tanks, assessment of fish stock, fishery and resource productivity, stocking policies, fishing effort, gears and craft used and such other aspects; document productivity potentials of different resources and explore feasibility for pursuing new activities, suggest appropriate measures/strategies for enhancing fish production in a sustained way through stock enhancement culture-based fisheries, conservation and propagation of native species. Departmental tanks and Gram Panchayat tanks which are linked to societies and tanks which are not linked to societies shall be studied. Fish ponds constructed under NREGA, NHM, etc shall be looked at with respect to their usability and linkages required. Use of non conventional water bodies for fisheries shall be explored.*
* ***Study aquaculture production systems*** *and practices, assessment of aquaculture potentials of existing and newly constructed water bodies developed under various supportive programs of Govt. including Mission Kakatiya and such others; suggest appropriate aquaculture species and farming systems for different water bodies keeping in view of retention capacity of the resources;* Inclusion of Vannamei (white prawn) species shall be studied. *study feasibility of Pen and cage culture for fish farming /fish fattening in reservoirs and large water bodies and suggest strategies for promotion; review backward and forward support system available in support of the practice, suggest scope for zonation for promoting aquaculture, required institutional support for Horizontal expansion v/s Vertical integration*
* ***Study Status of fish seed production in the State-***seed production/ procurement of spawn, fry/ fingerlings, seed rearing activity; species used and present practice for stocking natural resources and commercial aquaculture; status of fish seed production /rearing centres, their installed capacity and extent of utilisation; examine *feasibility for intensive seed rearing* viz., seed rearing in land based facilities, also in pens, cages, coves etc. and *in situ* fish seed rearing in peripheral tanks surrounding reservoirs/tank water bodies, natural ponds/ pools within reservoirs/ perennial tanks catchment etc., rearing of advanced fingerlings; asses brood stock management and breeding practices followed in seed production centers; analyse gap between requirement and production; *suggest strategies for quality fish seed production of carps and other cultivable species viz.,murrel,* Nile/Gift *Tilapia, Amur common carp, Pangasius, scampi, ornamental fish and indigenous fishes for self sustenance, propose* short and long term plans for seed production to meet the present and future demand and species priority.
* ***Study*** *f****unctioning of Fishermen cooperative societies*** *and federation-roles and performance, identify issues, problem and constraints, reasons for their poor performance/non-performance and explore mechanisms for better and viable performance with increased return/unit effort; review registration process of new FCS, enrolment of new members and membership enhancement to existing societies, functioning of SHGs, farmers groups; process and mechanisms for organizing fishers to come together and function better with increased return/unit effort; suggest strategies for strengthening of Fishermen cooperative societies. Matsya Mitra Groups (MMG) and disadvantaged groups (like widows, physically challenged members of society) shall also be part of the study to identify creation of fisheries related livelihood options. Fisherwomen Cooperative Societies which are marketing cooperative societies shall be studied.*
* ***Study status of available infrastructur****e in terms of their extent of use in the entire supply and value chain of the sector (hatcheries, seed rearing farms, ice factory, dressing centres at reservoirs, landing centres in major reservoirs****,*** *auction halls and storage facilities in the fish market places etc);**assess additional Infrastructure needs (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.), suggest strategies for revitalization/ strengthening of existing infrastructure facilities.*
* ***Assessment of domestic fish consumption, demand & supply****, consumption patterns during peak and lean seasons; Per capita fish consumption/ availability/ and supply; share of domestic production to domestic needs*
* ***Study market potential****- study fish marketing trends, market potential, scope and opportunities for exports and imports (fish, scampi, ornamental fish & accessories); role of fish marketing intermediaries, processing and value addition, produce/ product pricing, market promotion; assess socio-economic changes among primary producers, marketing functionaries and associated risk factors of inland fisheries and aquaculture; assess the present use of technology in the marketing of fisheries and suggest need for and method of increasing the use of technology in fish markets; assess status of present share of total benefits among producers, intermediaries and other stakeholders in the value chain and suggest appropriate measures for improvement; identify scope for enhancing share of producers; suggest policies for ensuring increased benefits to producers in the entire value chain; suggest strategies to avoid prevailing middle men system in marketing at different levels by facilitating direct involvement of FCS in marketing at different levels; explore promoting fish markets through PPP mode, e-Marketing and use of Mobile apps and websites etc; Suggest strategies to avoid prevailing middle men system. Hyderabad shall be treated as a separate category for studying markets. Wholesale markets shall also be studied. Study the construction of existing markets, unit cost for construction of new markets and gaps in implementation. Different units costs suggested under various schemes to be studied. Branding of vending units through horns, dress code for vendors to improve monitoring and creating unique selling proposition for societies.*
* ***Study existing institutional arrangement/support services*** *in position in support of backward and forward linkages for the entire supply and value chain; review various extension and HR related trainings & Capacity building, Skill development, dissemination and diffusion, handholding programs that are being implemented, identify short comings and suggest appropriate extension and training modules for the capacity building of institutions, diversified stakeholders and others involved in sector related activities; study present organisation set up, roles and responsibilities of personnel at head office, district and field levels of Fisheries Department and other concerned autonomous bodies directly involved in production, value addition, processing, marketing of fish and fish products; review roles and responsibilities of personnel at head office, district and field levels, assess effectiveness of the present set up in carrying out various tasks related to fisheries growth; identify need for re-organising, revamping of the DOF to meet emerging challenges; study budgetary policy of the GOT and trends in allocation of resources to the Fisheries sector and identify gaps; assess* ***manpower requirement*** *(at HQ and field) for implementing all planned activities; suggest an effective HR policy for the Fisheries Department that would address all the issues both present and anticipated; HR development programs for the existing institutions (KVK’s, DOF, private and others).Institutional arrangements to help fishermen, private entrepreneurs and creating synergy in the activities shall be looked at. Convergence with irrigation department and other line departments for improving infrastructure related to fisheries. Suggest mechanism to handle conflicts between fisheries, irrigation, tourism departments where resources are shared and between stakeholders, user groups. KVK, Research institutions, veterinary institutions shall be studied.*
* **Carry out an empirical s*tudy of finance and credit related support*** *of banks, cooperative institutions etc* to fisheries activities at individual, Cooperative and Corporate levels; *identify credit related gaps. Similarly for the insurance support; suggest strategies for coordination and facilitation of financial support, flow of credit, insurance support by related institutions to fishers and other stakeholders involved in sector related activities.*
* ***Study on-going policies in practice*** *to mitigate constraints related to sector supply and value chain; review policies and programs related to resource access (lease/licensing), fishers’ welfare, input support to community and others; assess ongoing schemes / programs/ interventions of DOF and other line departments that have focus on equitable growth of fishermen community and the sector; study implementation of conservation measure like mesh size and close season, ban on exotic fishes that are detrimental to the local fauna;* review state fish seed policy if any, document present status of regulating seed import from other states and suggest improvement for quality seed production/supply - feasibility of identifying exclusive centres for breeding purpose- improve seed quality through Best hatchery management practices linked to multiplication centres; *suggest appropriate Fish seed policy to regulate quality issues viz.,*  rgistration and accreditation of *hatcheries and m*ultiplication centres, *fish seed* certification etc.; policy for *promotion of cage/pen fish farming in selected reservoirs and large perennial water bodies; river ranching and other conservation measures for enhancement of riverine fisheries, promotion of Eco-tourism and sports fishery, HRD policy (changes/new policies) needed to empower fishing communities, suggestions on amendments/improvements for ensuring judicious representation accorded to the fishermen communities in respect of allocation of water bodies (reservoirs and tanks and other structures used for fisheries activities); policy support to encourage private participation in entire aquaculture related activities; scope for insurance coverage for the entire supply and value chain to cover risks and unforeseen* (natural calamities, climate change, mortality from diseases, theft etc); s*uggest appropriate mitigating strategies to restore /protect both environmental and ecological sustainability. Treating aquaculture in par with agriculture to provide subsidy and benefits to improve the sector. Study feasibility of using water bodies which are used for drinking water purpose for fishing activity. Fishing ban policy in light of changing weather patterns shall be reviewed and need for change shall be explored. Impact of government seed stocking with respect to increase in production and change in ground dynamics shall be studied. Usage of motorized crafts in reservoirs shall be studied. Evaluation of existing cage culture practices, subsidy requirement, using high value species, carrying out seed rearing in cages, conflict resolution between local fishers and cage culture practicing fishermen shall be studied. Feasibility of privatization of cage culture in reservoir shall be explored. Comparative analysis of policies with other states and provide example of policies from other states.*
* ***Documentation of socio-economic issues of fishers and others*** *involved in fisheries and aquaculture activities in selected study sites; Identification of Socio- economic issues emerged due to changed resource use pattern, access rights, multiple uses of water bodies by different stakeholders, competition for use of common property resource, resource degradation associated to intensive aquaculture and such others; suggest ways and means to enhance community benefits and improve socio economic standards.*
* **Identification of scope for sharp focusing on any other aspects/issues so as to ensure accelerated growth in sector-** Scope in investment opportunities for promoting commercial fish farming, post harvest and value addition and marketing; Entrepreneurship development- business promotion by roping in more of private investment and participation in support of aquaculture development in the state. Scope for roping in innovative aqua culture practises like RAS, aqua phonics, etc where ever feasible.
* *Providing* ***recommendations*** *for the overall sector growth in the state*

**Scope of the study**

Although the scope of the study include all the 10 districts of State, the districts and Gram Panchayats from these districts are selected as sample as defined in the sampling methodology.

**Sampling and Evaluation Methodology:**

AFC Study Team would devise a suitable methodology for carrying out the tasks, based on the recommended survey sampling design.

The Study would be carried out as mentioned in the tasks on the basis of a stratified purposive sample system

For the collection of primary data, the whole state to be divided into three nearly homogeneous groups called strata (each stratum comprising a number of districts) on the basis of certain characteristics such as climate, rainfall, soil quality, resource spread, fisheries and aquaculture activities, intensity and diversity etc. and the strata will be formed in such a way that geographical contiguity of districts within the stratum is maintained (Stratum 1: Adilabad Nizamabad and Karimnagar districts; Stratum 2: Warangal, Khammam, Nalgonda districts andStratum 3:Medak, Hyderabad, Rangareddy,Mahbubnagar districts). Sampling 25-30% resources within each district spread across different Gram panchayat/village clusters selected at random employing stratified three stage sampling where districts, clusters and ponds are 1st, 2nd and 3rd stage units of selection respectively. Stratified three stage sampling with Fishing Village Approach (FVA) or Landing Centre Approach (LCA) for reservoirs/dams to be followed.

**Study plan**

Information on water bodies (location wise) and related secondary data to be collected from Department of fisheries and other institutions viz. Minor Irrigation Department, Zilla Parishad**/** Village Panchayat**,** watershed *etc* for resource mapping*.* The data will also be complemented with satellite data (satellite imageries for pre and post monsoon period 2016-17), processed remote sensing imageries (GIS) and base map topo-sheets etc. if available freely to the DOF, GOT from Govt. institutions/organizations (CIFRI/National Remote Sensing Agency (NRSA), Hyderabad/ State Remote Sensing Application Centres etc.) who are involved in national resource mapping studies. Assessment of biological productivity of resources would involve field investigators collecting required water/soil samples, also biotic community (plankton, benthos, macrophytes etc.) from selected water bodies and laboratory analysis. Primary data on type of fish stocks in a few selected water bodies will be collected by field enumerators by operating multi-meshed nets in reservoirs and by selective fishing in tanks and also by analyzing catch composition in the landing centers and market arrivals from the water bodies.

As per requirement under the study, AFC Study Team would collect relevant primary/secondary data from the concerned beneficiaries, departments/agencies through different study tools-structured schedules/questionnaires in respect of beneficiaries sample survey, Case Studies, Farmers Group Discussions; carry out data analysis. The study involves devising suitable questionnaires/formats for carrying out one to one and one- to many discussions, conducting Focused Group Discussions with all key stakeholders to collect their views and opinions for improvement and interviews for capturing all relevant and comprehensive information from the key stakeholders viz., fishers, aqua culturists, DOF officers, different agencies/individuals etc. Case studies / best practices will also be documented wherever possible.

Task wise study methodology, as detailed in the technical proposal to be used by AFC Study Team.

The field studies to be monitored and supervised by the core team members who will visit the selected sites, guide the investigators on the methodologies to be followed in carrying out the study.

Based on the baseline study findings, estimates will be made for the state water bodies in terms of their productivity and production potentials, required forward and backward support system, additional infrastructure, markets, processing and value addition units in support of holistic sector development .

The contribution to the generation of additional employment and income to a large number of rural households involved/assisting the activities, sector growth, Agriculture GDP and state economy envisaged due to implementation of proposed new strategies and approaches, pro sector schemes/programs and policies to promote fisheries and aquaculture will also be estimated /projected.

**Deliverables time schedule**

AFC Study Team would adhere to the stipulated time schedule of **five months** from the start with release of first installment of consultancy cost (excluding the time taken for approvals)

The AFC is expected to adhere to the following timelines and deliverables.

**Deliverables** **Time lines**

* 1. Work plan submission : One month after issuance of Work Order and TOR
  2. Field Data Collection : Two months from date of work plan approval.
  3. Draft report Submission : One month after field data collection.
  4. Final Report Submission : One month from draft report submission.

The DOF would provide all the necessary information related with the study and extend assistance/support to AFC study team during the assignment, and facilitating consultant organization in completing the study in the stipulated time

District / Taluk officials of DOF and other concerned departments would be advised for providing the required information/data connected with study and cooperate in holding the FGDs with the stakeholders at the taluk and GP levels, support AFC Study Team in a time bound manner so as to meet time study deadline

For the purpose of the study, a Study Team would be mounted comprising ‘Core Team of Multi- disciplinary Experts’ a) Fisheries experts: Two, b) Extension & Training Expert: one, c) Surveys and Field Studies Expert: one, d) Fisheries Economists and Sociologist: Two and Support Team viz.a) Data analyst: one, and b) Documentation expert: one. For field survey, Field level enumerators to be positioned to carry out the tasks as listed above for each of the selected district/cluster districts under the guidance of Core Team of Multi- disciplinary Experts.

**Contact person/s nominated from DOF to coordinate the study:**

**Others:**

* During the period of engagement, AFC will provide professional services for the captioned assignment, will exercise necessary skill and expertise, as required for the nature of the work entrusted in fulfilling the tasks and will extend full co-operation & assistance to other colleagues and create harmonious atmosphere during execution of work assigned to them.
* The work shall be of quality and content, as expected of a professional. The AFC shall submit periodic progress reports to DOF, GOT.
* The DOF, GOT will review the progress of the assignment and quality of the deliverables from time to time