

Executive Summary

Resources, potential and proposed interventions for growth

The state of Uttar Pradesh has vast and varied inland fisheries and aquaculture resources which are at various levels of utilization. Fisheries resources are in the form of network of rivers and rivulets, reservoirs, network of irrigation canals and extensive floodplain wetland. All these are Common or Public Property Resources –CPR/PPR). Aquaculture is mainly practiced in un-drainable simple excavated multi-purpose ponds. Most of these ponds are owned by the government and hence these are CPPs and commonly called as community ponds. There are limited numbers of ponds which are owned by farmers and known as private ponds. There are vast span of water logged areas under the ownership of both, government and private. These are potential areas for aquaculture development by converting into fish ponds and farms.

Aquaculture

Aquaculture has huge potential for development through both expansion and intensification. Out of the 1.61 lac of community ponds only 70,000 ha are presently used for aquaculture. There is scope for using the remaining 91,000 ha of community ponds after undertaking renovation and improvement. Private ponds covering a total area of about 12,000 ha are under total utilization though with traditional culture technology with minimal level of input use. There are huge tract of water logged areas which are suitable for construction of fish culture ponds and farms by private sector. About 60,000 ha of additional fish culture ponds can be developed in water logged areas including 10,000 ha for culture of new species, under private sector. Thus by expanding the total area for aquaculture from the present 82,000 to 2.33 lac ha and promotion of technology backed intensification the total fish production from culture sources will increase from the present 2.648 lac tons to 13.769 lac tons by the end of the ten year long development programme. This will also increase the relative contribution of aquaculture to total fish production from 62.22 to about 77%.

Diversification of aquaculture

Diversification of aquaculture is important to make this industry vibrant and ever-growing. New candidate species having high production and market potential include *Pangasius* species, native catfishes (*magur* and *singhi*) and giant freshwater prawn (*Macrobrachium* sp). Proposals have been to establish 23 hatcheries to meet the seed requirement of these species. Similarly, diversification of aquaculture with the introduction of legally cleared new species is also encouraged.

Integrated fish farming

Integrated fish farming is highly suitable for farming households who own or have access to pond and also keep livestock animals. With a largest population of buffalo and cattle in the state, the growth potential of integrated fish farming is huge. However, promotion of integrated fish –livestock farming essentially requires a collaborative programme between DoF, DoAH and the Department of Dairy.

Ornamental fish culture

Global ornamental fish business is estimated at over US\$ 8 billion in which India's share is decimal. However, this industry is picking up in India with the growing domestic and export market demand. This home based enterprise is highly suitable for women and their economic empowerment, both rural and urban. The focus in this area would be on development of technical and entrepreneurial skills among women and under-employed youth to take up ornamental fish culture on a business mode encompassing supplementary activities such as manufacturing of aquaria, packaging and marketing of aquarium fish and aquarium accessories, providing periodical maintenance services to aquarium keepers, etc. There is also great scope for rearing of ornamental fish in cages installed in reservoirs. Provision has been made for establishing 8 ornamental fish breeding hatcheries and 200 rearing units.

Reservoir fisheries

The current average fish from reservoir is poor, only 15 kg/ha/y thus producing only about 1000 tons annually from 1.49 lac ha. The overall untapped potential for the Indian reservoirs worked out to be 280 kg/ha, which is more than nine times the current fish yield. The proposed intervention plan for the reservoirs are aimed at supplementary stocking with quality fingerlings of Indian Major Carps; creation of adequate rearing space for ex-situ/in-situ production of quality fingerlings for stocking; introduction of Co-management regime for the management of reservoir fisheries by involving fishers as active partner in planning, implementation and decision making process; bringing all the reservoirs under scientific fisheries management practices; leasing of reservoirs on long-term; and continuous programme for HRD of reservoir fisheries managers and fishers. With these measures it is expected that annual fish yield will increase to 400 kg, 300 kg, 100 kg and 50 kg for small –A, small-B, medium and large reservoirs respectively thereby increasing the total fish production from reservoirs from the current level of about 1000 tons to over 6200 tons. Culture practice to be adopted in small reservoirs.

Floodplain wetland fisheries

There is vast expanse of floodplain wetlands in the form of ox-bow lakes, tectonic lakes and other riverine wetlands covering total water spread area of over 4 lac ha. These water bodies are important fisheries resources which are lying highly underutilized. Besides producing fish these aquatic ecosystems provide a wide ranging ecosystem services serve as rich repository of biodiversity and while acting as renewable source of capture fishery they also complement riverine fisheries in many ways. These resources come under the domain of common or public property resources (CPR) and hence assume greater importance not only for increasing inland fish production but also for providing livelihood and nutritional security of a large number of resource poor communities who live with and thrive on these resources. A two-pronged approach consisting of (i) conservation and restoration of ecosystems, and (ii) increasing the production and productivity under community based management regime is needed for sustainable utilization of these resources. Culture-based fishery is the most common mode of fisheries enhancement in wetland ecosystems. Limited technological interventions can substantially increase the yield by utilizing the natural aquatic productivity. Timely stocking with bigger size fingerlings of desired species and in appropriate number would be the most important and effective management measure. Ox-bow lakes are defunct river beds and in most cases utilized by groups of local fishing communities. Smaller ox-bow lakes (up to 20 ha of water spread area) are equally suitable for aquaculture. Shallow peripheral water areas are highly suitable for enclosure culture in the form of pen. Pens are securely

fenced part of the bigger lake ecosystem with greater convenience and control. Current level of fish productivity is quite low to the tune of about 300 to 400 kg /ha against the potential yield of about 1.5 - 2.0 tons/ha/y

About 1.64 ha of water logged areas lying grossly underutilized are suitable for development of aquaculture by converting these water logged areas into aquaculture farms and ponds. There is good scope for engaging professional fisheries graduates, entrepreneurs, farmers in this venture to convert this area into a hub of aquaculture. Appropriate policy is required to be framed up for encouraging private sector (farmers, entrepreneurs, professional graduates) for establishing farms, ponds, hatchery, seed farms, feed mill, processing plant etc.

Riverine fisheries

Of the available fisheries resources, rivers of the state are overfished and fishery is rapidly declining. These rivers are the original abode of the most valuable inland fish species including Indian major carps, the backbone of Indian aquaculture. Riverine fisheries support a large number of traditional fishers living in the vicinity and engaged in fishing and other allied activities. The fishery has shown serious structural changes and witnessed a sharp decline over the years leading to loss of livelihoods and income of riverine fishing communities. Entry of exotics and indiscriminate fishing are major reasons for decline of valuable catch in addition to pollution and other anthropogenic activities. Regulatory regime has also lost its relevance due to loss of priority, means, support, capacity and institutional arrangements. To save this resource from further decline and to prevent reaching an irreversible state rivers deserve rehabilitation of stock through several interventions including river ranching, for restoration of habitat and introduction of effective enforcement, and introduction of responsible fisheries with active participation of fishing communities. This area deserves priority attention.

Fish Seed Production

The success of the proposed programme would largely depend upon the availability of quality seed in sufficient quantities. Currently there are 209 carp hatcheries in the state including 19 under DoF or related agencies which produce about 1400 million fry annually. On an average there is 30-33 percent survival from spawn to fry and 60 percent from fry to fingerling stage. The survival level has to be increased through better management and technological inputs. Provision has been made for 285 additional carp hatcheries and 23 hatcheries of new candidate species to meet the expected requirement. An amount of INR 22.8 crore has been allocated to provide subsidy for construction of new hatcheries in the private sector. Once these all additional hatcheries are put in operations, they would be able to meet the requirement of 2893 million fingerlings. Out of this 2373 million fingerlings will be required exclusively for aquaculture. Quality of fish seed is another emerging issue. To enhance the quality of stocking materials provision has been made for establishing one state level quality brood bank. This brood bank will receive quality brood stock from the national brood bank facility being established by NFDB at Bhubaneswar. In turn the state brood bank will supply quality brood materials to hatcheries in the state. In addition to this a fish seed quality certification policy is also proposed which is based on the guidelines circulated by the DOAHDF (Ministry of Agriculture, GOI) (Annex- II). It is also proposed that after necessary renovation existing government hatcheries will be outsourced to private operators in PPP mode.

Similarly there is matching need for developing seed rearing facilities for producing desired size of fingerlings for stocking. Currently there are 50 farms in the Government sector and 459 in the private sector. These farms are of the size of 1 ha each. To meet the requirement of fingerlings additional 2700 rearing units has been proposed to be established in the private sector.

Recreational fisheries

Recreational fishing, largely a pastime activity or for pleasure is growing with tourist industry. In some countries recreational fisheries established along freshwater lakes, reservoirs and rivers have become so popular that it outweighs the primary fisheries activities in terms of value. Many city dwellers like to spend their leisure time living in typical village setting with their families where paid fishing may become an interesting engagement. The recreational fishing industry also includes enterprises such as the manufacture and retailing of fishing gears and other equipment and appliances, designing and building of recreational fishing boats, provision of fishing boats for charter, guided fishing trips and even offering fresh / live fishes to be cooked and served. In the context of the state of Uttar Pradesh extensive resources are available in the form of rivers, lakes, reservoirs, dams and ponds to anchor recreational fisheries.

Marketing infrastructure, value addition and food safety and quality standards

Lack of diversified fish products and hygienic fish market are also responsible for low consumption level in the state. Availability of clean and hygienic domestic fish markets is critical for attracting consumers and increasing acceptability. Apart from ensuring desired nutritional quality development of hygienic and clean fish markets and cold chain also help in minimizing post-harvest losses, creating more jobs and raising higher level of food quality and safety standards. Marketing infrastructure and cold chain system will benefit the state even in the long term when surplus produce will be available to be spared and exported to the neighboring states and other countries. Marketing infrastructure and cold chain will also open new vistas through processing and value addition.

There is need to improve infrastructure facilities at fish landing centers along reservoirs, rivers, floodplain fisheries where large volume of catches are landed. Efforts to increase fisheries productivity needs to be complemented by fish consumption promotion and availability of wide ranging fish products making use of low value fish species. Culture of pangasius and tilapia is expected to catch up due to their higher yield. These species are quite suitable for boneless fish fillet production for which there is a growing demand in domestic and export markets. There is an emerging niche in marketing of fresh or live fish. Opening a chain of modern and hygienic fish kiosks in most of the cities of the state is an emerging opportunity for fisheries professionals, other educated youth and young entrepreneurs. They need to get directly connected with clusters of small producers, give the farmers better deal and also get assured regular supply of fresh or live fish for their business.

Proposals have been made for establishing a network of 526 fish markets in capital, big cities and other towns and one fish processing plant in the public sector. However, this would depend on the level of support extended by the Department of Urban development. An amount of INR 365 crore has been allocated that covers cost of subsidy, cost of training and grant to the State.

Contribution to food and nutritional security, livelihood and rural economy

Food and nutritional security

In the context of the state, where protein malnutrition is a serious problem with 42.3 percent of its children under five are underweight, there is need for enhancing production of fish – an affordable source of quality animal protein. Currently the entire production of fish from the state is consumed within the state and about equal amount is also brought from other fish surplus state to meet the local demand. As with the national average about 56 percent of the existing state population of 19.95 crores are non-vegetarian and about 40 percent are regular fish eaters. With the current level of fish production the state is able to provide fish at the rate of 5.88 kg per capita/y to its 40 percent of fish eaters against the desired level of 15 kg /capita y as recommended by the ICMR. With the current rate of population growth the state population is likely to reach 25 crores within next ten years. By then the state would be required to produce about 15 lac tons of fish annually to provide fish at the desirable rate of 15kg per capita / y for its 40 percent of fish eating population. At the end of the project the total fish production of the state will touch 17.885 lac tons mark and at that point the state will be able to export surplus fish after meeting its per capita availability at the rate of 15 kg / y as prescribed by ICMR.

Rural livelihoods

Fisheries sector provides sizable rural livelihoods especially to those who need most – the disadvantaged traditional fishers, farmers and other resource-scarce landless rural communities. Livelihood opportunities is made available through a range of activities such as fishing in open waters; farming of fish in ponds; seed production activities such as hatchery operations, seed rearing and transport of seed; and other ancillary activities . Fishing being largely a seasonal activity, a sizable number of fishers migrate and interphase between rivers and reservoirs, lakes to ponds for fishing and also go elsewhere to get other jobs. Under the situation it is impossible to get an accurate data on employment in fishing activities, however, only a guess estimate could be made by taking fish yield and production and their values into consideration. According to rough estimate of the DoF about 26,000 people are engaged full time in fishing related activities. Equally difficult is to calculate the number engaged in ancillary activities like fish marketing. And as such we have not come to any conclusion on employment in marketing and value chain management and hence data is not included in the report. Compared to capture fisheries it is easy to arrive at employment figure in aquaculture related activities as there are certain known criteria. As per estimates of the DoF currently over 89,000 people are employed in aquaculture, seed production and seed rearing activities. The figures thus suggest that at least over 2.02 lac people are directly engaged in the sector. As per the global review of fish production and employment of the FAO¹, the highest concentration of people employed in the primary sector is in Asia where one person is employed for every 2.4 tons of fish produced. On the basis of these criteria also the total number of people employed in the fisheries sector would be 1.8 lac. With the proposed development of fisheries sector it is expected that an additional of 6.3 lac full time employment will be generated.

¹FAO, 2010. *The State of World Fisheries and Aquaculture 2010*.FAO, Rome.218 p.

Support to rural economy

The total budget requirement for the proposed ten year plan is estimated at INR 11523 crores which includes an amount of INR 3867.984 crores as subsidy to beneficiaries, INR 2527.326 as grant to the state government and INR 5128.277 as investment to be made by the beneficiaries (farmers, fishers, entrepreneurs and other private sector participants). However, for the amount to be invested by the beneficiaries they may mobilize from their own sources and also seek institutional credit from banks. At the end of the plan (10th year) it is expected that there will be a net return of INR 10770.92 crores over the total investment by the Government and the beneficiaries made during that year. After excluding beneficiaries share in investment the net return over government investment (INR 6395.310 which includes both – amount of subsidy given to beneficiaries and the grant received by the government) will be to the tune of INR 4,375.61. The value of fish produced has been calculated at the rate of INR 60 / kg.

Issues and constraints

Frail state of the core institution – the Department of Fisheries

Adequate staffing and organizational strengthening

The DoF, which is supposed to be the centre of fisheries governance and key driver of development, bears a fatigued look. Prolonged neglect, inability to understand and appreciate the complexities of ecosystem and community relationship, depleting inflow of science and technological inputs and most importantly unable to realize the potential of the sector on the part of the policy makers are responsible for the current state of DoF. According to common perception collection of revenue by leasing out state owned water bodies, disbursement of subsidies provided under various schemes and enforcement of acts and regulations, as and when possible, has become the sole activities of the DoF. Undermining the importance of assigned responsibilities and functions of the DoF, their field personnel are very often kept engaged in non-fisheries activities. Growing sense of hopelessness among the personnel of DOFs is evidently visible due to long stagnation, lack of career advancement and capacity building opportunities. They are also subjected to prolonged deprivation by lack of cadre review and not being treated at par with their counterparts in agriculture, animal husbandry, dairy and other allied sectors of agriculture. The cumulative effect of all these have resulted in growing sense of frustration and loss of professional pride among the personnel and an overall weak institutional setting of the fisheries sector.

The DoF is currently running only with 241 technical personnel against a total sanctioned position of 569. Similarly there are only 49 sanctioned posts of district level officers (belonging to Cadre – II) against 75 districts and out of the sanctioned posts 10 are lying vacant. The department does not have outreach capacity to interface with fishers and farmers at resource levels as there is no position of block level officers. It is impossible on the part of the district level officers to cater the need of a large and increasing number of clients (fishers and farmers), settle revenue related matters and undertake enforcement of fish acts and regulations. Surprisingly there is no cadre review from the very inception of the DoF in 1966 although there was cadre review for all other departments in 2006. Similarly a large number and range of issues are also required to be addressed through appropriate policy interventions.

Institutional strengthening needs to incorporate adequate development orientation (change in outlook and action – from engaged only in routine functions to driver of development); desired organizational restructuring for quick decision making process, efficiency and accountability; infusing sense of professional pride among the personnel by giving fair deal to the staff; providing career advancement opportunities; organizing training for the DoF personnel to acquire technical knowledge

and skills. This is equally important that they develop social mobilization and communication skills. These are vital for field staff engaged in extension and facilitating co-management regime. All these relate to the core-competency of DoF. These traits and capacities are pre-requisite for quality implementation of natural resource based development programme and schemes and establishing good governance in the fisheries sector.

Rudimentary extension services system

The primary producers of the fisheries sector, fishers and fish farmers are resource limited and have hardly any access to fisheries / aquaculture extension services. On the other hand any further development in the sector would require sound technological back up. The situation thus calls for a dedicated, efficient and easily accessible extension services system under the DoF. This would help the fishers and farmers in acquiring and applying necessary knowledge and skills of desired technologies and sustainable management of resources.

DoF is required to provide two pronged extension services – one for harnessing the potential of CPR based open water capture or culture based fisheries and the other for farming of fish in privately owned resources like ponds and tanks which involve two different resource user groups (fishers and farmers). In addition to this the extension system also needs to provide bundle of other services ranging from technical training and advisory support, assisting in mobilization of critical inputs, facilitating access to institutional credit, delivery of incentives, market facilitation, and conflict resolution instead of just conventional transfer of technology approach.

Existing organizational structure of the DoF is neither conducive nor capable of delivering extension services. There is no provision of staff at the block level. Similarly there is no provision of separate field staff to be deputed to monitor reservoirs and riverine fisheries. Recruitment of staff against all the vacant positions, creation of additional technical positions and fielding of extension officer in each Block will be pre-requisite for implementation of the proposed development programme. The government may look into the possibility of appointing the Block level officer on contractual basis as done in Bihar or subcontract the service to NGO / Social Enterprise agencies. Adequate and rigorous foundation training would be required for the new entrants before sending them to the field. At the same time necessary steps are taken to address the long pending cadre revision, bringing parity with staff of other allied sectors, creation of senior level technical positions, etc.

Fisheries database and Monitoring and Evaluation System

There is no reliable up-to-date precise data base on various resources and the state of resource use. Indeed there is an enormous knowledge gap that spells out a disturbing element of uncertainty into the planning process. There is an urgent need for creating an institutional mechanism for building a comprehensive data base on resources and the state of their use. A dedicated, fully equipped and accountable central unit with effective field level linkages and mechanism need to be established on top priority basis.

As usual with most of the Government departments the DoF does not have any M&E system for monitoring and evaluation of various programme and schemes being executed by the department. It is imperative that a computer based Monitoring and Evaluation system is introduced in the DoF to ensure higher efficiency, judicious use of scarce public resources and improving quality of implementation. In fact, monitoring and Evaluation be incorporated as an integral component of all programme and schemes. To facilitate effective monitoring it is also required that each component of the Perspective Plan be developed adequately to incorporate clarity of objectives, expected outputs, planned activities

to produce expected outputs, persons responsible for implementation and verifiable monitoring indicators.

Policy decisions and programmatic planning and review must be informed by a grounds-up assessment of resources, needs, utilization, etc. A real-time feedback system would greatly enhance our ability to respond to situations and take timely decisions. Recent developments in cloud computing and low-cost handheld devices can be tapped to set up an infrastructure that integrates data acquisition, management, analytics and decision-making.

Acquisition of Technology through linkage with fisheries research and education institutions

Development – research linkage is highly desired for technical strengthening of the DoF and also for maintaining its technical orientation. At this stage there is a critical need for transfer of technologies from line ICAR institutes like CIFA and CIFRI by organizing pilot scale demonstrations of improved technologies and resource management practices in collaborative mode. Such programme would also forge strong bondages between research institutes and the DoF. Similarly DoF should also get involved in field based research programme of these institutes wherever possible. Linkage with research institutes will also help the DoF in implementation of human capacity building programme.

Linkage with the Fisheries colleges of the state would be mutually beneficial. Recently established fisheries college at Etawa and Faizabad under the two SAUs are still fighting for its existence. Strengthening of these two fisheries colleges required to meet the expected human resources needs of the state. These institutions need to be supported in terms of staffing and infrastructure facilities. The sector would require large number of technicians to run hatcheries, feed plants, processing plants, aquaculture farms etc. These colleges may wish to plan and start few such courses of shorter duration in consultation with the DoF.

Human capacity development

A special focus on human capacity development is particularly important partly because of emerging technologies, new approaches to fisheries management and also because of changes in the national and international development context. Capacity development is required for the personnel of DoF, fishers, farmers and their organizations (Fisheries co-operatives /SHGs). In view of the growing emphasis on human capacity development training is becoming an important and significant component of most of the development programme and projects. It is important that training need assessment is carried out for each specific groups and the detailed requirement is also worked out based on such assessment. Accordingly group specific training modules are to be developed.

A sum of INR 240 crores has been allocated for the strengthening of DoF. This includes the salary of 900 Fisheries Extension officers, establishing Fisheries Database, M&E system, training and study tours, providing laboratory facilities and demonstration of technologies.

Policy issues

Sustainability concerns and Governance

Regulatory regime has lost its relevance due to loss of priority, means, support, capacity and institutional arrangements. Stretches of rivers are leased out without keeping DoF in decision making process. While doing so no conditions related to ban on fishing period, use of destructive gears and destructive fishing practices, limiting efforts are imposed resulting in the sad state of riverine fisheries. “The right to fish carries with it the obligation to do so in a responsible manner so as to ensure effective

conservation and management of the living aquatic resources". Good Fisheries Governance is expected to promote the maintenance of the quality, diversity and availability of fisheries resources in sufficient quantities for present and future generations in the context of food security, poverty alleviation and sustainable development.

It is important that private entity or the resource dependent fishing communities and their organizations are able to resolve the inevitable conflicts between economic efficiency, social equity and ecological integrity adequately within a market based system. Under the circumstance the co-management approach to fisheries which provides a partnership between the state and the fishing communities owned organizations is the only effective approach for ensuring that the social obligations attached to privatised use rights are properly honored. The current centralized forms of fisheries management has been proved to highly ineffective in meeting and safeguarding social and environmental concerns. On the other hand co-management involves consultation over the framing of policy and the delegation of specific management responsibilities to fishermen's organizations. The co-management system also allow the entry of private entity for specific role to play, such as marketing, value chain management etc. Though this approach is indeed more reliable, it does not ensure that all the user communities will follow the recommended responsible fisheries management norms.

Fish acts and regulations.

The DoF need to be in a position to facilitate as well as exercise its authority in responsible management of the resources .Currently there is no effective legal instrument for protecting fisheries. Much of the legislation is related to 1948 Fish Act and many of the provisions are no longer relevant. Therefore there is an immediate need for its revision in particular with relation to sustainability concerns of the resources. This is also high time that supporting rules are framed for the enforcement of United Province Fisheries Act, 1948. Currently there is no legal instrument to prohibit and control of the spread of illegally introduced exotics like African catfish, Chinese bighead, etc, in our open water ecosystems.

Leasing policy

Leasing of community ponds and floodplain wetlands

Fish production and productivity of any resource are also affected by the resource lease policy. We need to make distinction between fisheries and fish culture and suitability of resources to carry on these two specific activities. Community ponds are exclusive resource for fish farming which is akin to agriculture or farming on land. Currently the Leasing policy gives high priority to traditional fishing communities and the fishermen cooperative societies who are more skilled in catching than farming of fish. And as such this policy gives limited opportunity to progressive farmers and entrepreneurs who are more used to farming and have relatively better access to resources and technologies to make better use of the ponds. For speedy growth of aquaculture in the state it is advisable that the community ponds be kept open to all. On the other hand the fishers and their cooperative be given priority in leasing of open water fisheries resources like rivers, floodplain wetlands, etc, where fishing is a major activity. And as such separate leasing policy is required to be developed for aquaculture resources like community ponds and open water fisheries resources like rivers, lakes and ox-bow lakes.

The minimum reserve price of community ponds as per the instruction of hon'ble High Court is relatively high. The Lagan of pond is fixed on total area of the ponds. There is need to address this problem. Similarly there is no policy for seasonal community ponds and as a result most of these resources to the tune of about 91,000 ha are lying largely wasted.

Leasing of Reservoir fisheries

The current reservoir policy is complex and several provisions are not clearly defined. As a result taking advantage of this opaqueness in the leasing system contractors and other entities resort to conflicts and litigations. The reservoir leasing policy has been revised to certain extent to bring more clarity in the existing system which would help in reducing cases of conflicts and legal scuffle. Pending institutionalization of co-management regime this revised policy is required to be enforced subject to approval of the government. The revised leasing policy is attached as Annex-III of this report. However, efforts attempts be made to develop and institutionalize fisheries co-management regime in the management of reservoir fisheries. Based on the experience gained appropriate policy reforms would be required for making the reservoir management policy more concerns to equity and environment aspects.

Quality of seed for aquaculture and fisheries development

There is growing concern about the deteriorating quality of fish seed for stocking. With due appreciation to this issue the GOI has drafted a seed policy and circulated to all states to help them developing their own fish seed quality certification guidelines. The same is attached here as Annexure-II for the consideration of the government for approval. Another step has been taken by the NFDB in this direction by establishing a national Quality brood bank at Bhubaneswar. This facility will provide quality brood fish to states. Provision for a state brood bank facility has been made in the plan.

Low priority and level of support / incentives to fisheries sector

Incentives in the form of subsidies, availability of institutional credit, rebate in interest rate, provision of Kisan card, allocation of water for fish farming, water and power tariff, tax, etc., are either not available, or if available, these are relatively much lower than agriculture sector. Such discriminations may not allow making best contribution of fisheries and aquaculture resources for food, nutrition, livelihood and economic security of rural Uttar Pradesh.

We also need to realize that there is no entity of exclusive fish farmer in the state; it is the same group of farmers who simply diversify their farming practice by adding an additional component of fish farming, as they do with livestock. Once they change their farming from crop to fish they are deprived of Kisan Credit Card, incentive in the form of interest on loan, input subsidy on yearly basis, canal water for fish culture and a lot of other benefits. This area deserves immediate attention.

Credit arrangements

Currently most of the credit proposals are raised to support aquaculture in community ponds which are Common Property Resources (CPR) and hence these are subject to approval of lease by the Department of Revenue. Department of Fisheries is unable to prepare credit plan for its submission to financial institutions due to late arrival of the list of leased out water bodies from the Department of Revenue. Revenue is the priority focal objective of the Department of Revenue while development of fisheries and aquaculture is the core concentration of DoF. Thus there is a mismatch of priority and any degree of coordination loss is going to affect the interest and aspirations of fishers and fish farmers. Further, the response of the bank in actual delivery of the credit to the fisheries sector is also much less than desired which is reflected from C-D ratio.

Weak / non-functional cooperative institutions

Fisheries cooperatives are suffering from acute sickness. Most of these cooperatives are now functioning as pocket organizations of few strongholds that operate and run these organizations without consulting and involving its members in planning and decision making process. Lack of transparency and trust deficit among members and its office bearers are clearly visible. There is a general loss of interest among members in cooperative mediated activities. In many cases the water bodies taken on lease by the cooperatives are sub-contracted to private entities thus frustrating the very objective and spirit of cooperative movement. This institutional weakness has frustrated the efforts of DoF to introduce technology based development interventions and ensuring equitable distribution of benefits to the local communities / members. Post leasing litigations are quite rampant. In the process, the potential of private sector is grossly undermined for leasing out of both – fisheries and aquaculture resources as priority are given to fisheries co-operatives. Deputation of one Cooperative officer at the HQs of the DoF does not serve any purpose. Organizational strengthening of cooperatives is highly required in the interest of the resource dependent communities as well as the ecosystem health.

Cross-sectoral issues

As with other natural resource based sectors fisheries sector also complement and compete with other sectors for resources. Reducing competition by integrating and optimizing use of resources and harnessing the potential of complementarily would be in the greater interest of the state. Thus the first step in this direction would be to mainstream this perception across these sectors and build a coordination mechanism at the highest level to strengthen cooperation and facilitate actions.

Departments like Department of Irrigation, Department of Revenue, Department of Environment and Forest, Department of Water Resources, Department of Urban Development, State Pollution Control Board, etc , are directly or indirectly involved with the management and development of fisheries resources and programme. Department of Irrigation, Department of Revenue and Department of Environment and Forest hold and own water and use for various purposes including irrigation, flood control, power generation and other purposes. Department of Forest and Environment on the other hand use water for conservation of biodiversity. Similarly, the DoF attempts to make best use of available water holds for conservation and development of fisheries and aquaculture and maintaining the health of aquatic ecosystems and its contained aquatic biodiversity. Existing arrangement of water use between the Department of Irrigation and DoF the right to manage fishery is vested with the DoF and in turn fishing right is extended to fisheries cooperatives or individuals on lease basis. In doing so

the Department of Irrigation is doing a great service to the poor and disadvantaged group of fishers by providing them livelihood opportunity and production of high quality protein food for the public in general. But somewhere the very emphasis on fisheries is lost which goes in favor of revenue which is generated by way of lease money. In the process the interest of fisheries becomes secondary resulting in critical situation for the very survival of fisheries at some occasion. On the other hand the leasing process is so cumbersome and complex that the DoF officials have to spend major time to facilitate leasing process, collection of lease amount and settling conflicts and legal issues. This issue deserves priority attention for a better and acceptable solution to enable the DoF to provide better governance and facilitate sustainable development of reservoir fisheries. Under the proposed programme there is a provision for developing seed rearing ponds in the vicinity of reservoirs which would require allocation of suitable land for the purpose by the Department of Irrigation.

Similarly canal water is provided by the Department of Irrigation for irrigation of crops on land and not for farming in ponds through aquaculture. Both, agriculture on land and aquaculture in pond are basically food farming and hence this discrimination to aquaculture needs to be removed.

The state has good and extensive network of irrigation canals which also retains water flows for several months. Flowing water with high level of dissolved oxygen offers opportunity for culture of fish in cages and also in small fenced segments -pens. A formalized agreement between the DoF and the Irrigation Department is pre-requisite for initiating this innovative development intervention.

There are a number of cross-sectoral issues which essentially require highest level of coordination support and complementation.

State level Overview Committee

There is an urgent need for establishing a State level Overview Committee (SOC) to provide cross-sectoral coordination support, overview progress and guide future course of development. Among other emerging issues the SOC will address inter-sectoral differences related to resource use, promote environmental protection and rehabilitation programme, facilitate pollution reduction, bring convergence between the programme and projects of various sectors and improve research – development linkage. The SOC will be headed by the APC. Leadership of departments like Department of irrigation, Department of Environment and Forest, Department of Water Resources, Department of Revenue, Department of Rural Development, Department of Urban Development, State Pollution Control Board, NABARD, Department of Animal Husbandry, Department of Dairy, other nationalized banks will be member of the SOC. Top functionaries of the DOF will participate as member and also provide necessary organizational support. Director of CIFA, CIFRI, NBFGR and few experts of repute may also be included in the SOC. The committee will meet once in six months to review the progress, look into the emerging issues and give direction for future course of action.

It is informed that the Department of Agriculture is preparing a policy to drain and dry out part of the floodplain wetlands for expanding area for agricultural. If this plan is allowed for implementation there will be a serious ecological disaster leading to colossal loss of biodiversity, decrease in ground water table, more intense and frequent flooding as well as strong negative impact on riverine fisheries. There is a close nexus between poverty and biodiversity and hence any loss of biodiversity will have serious consequences on local livelihoods.

It is expected that at the end of the plan (10th year) aquaculture production will reach 13.769 lac tons mark thus contributing to about three fourth of the total fish production of 17.885 tons. Development of aquaculture and fisheries is also expected to increase employment from the existing 2.02 lac to about 8.3 lacs. At that stage the state will also be able to export surplus fish to neighbouring states and other countries after meeting its demand of 15 kg / capita / y of fish for its 40% of fish eating population. The

total cost of the proposed scheme comes to 11,523 crores which includes the amount (INR 2527 crore) the Government of UP will receive as grant from the NFDB or other sources and subsidy of INR 3,867 crores to be given to beneficiaries. The programme is built up on active participation and contribution of beneficiaries. Beneficiaries share in the investment would be to the level of INR 5128 crore for which they will seek institutional finance and / or from their own resources. The value of fish produced during 10th year comes to INR 10,731 crore which indicates the sectors expected contribution to the rural economy of the state.

The proposed plan is likely to succeed subject to adequate strengthening of the DOF, capacity building of primary produces of the sector and the cooperation and desired support of the concerned Gov. Departments like Department of Revenue, Department of Irrigation, Department of Urban Development and financial institutions.

The proposed development programme has been prepared in conformity with the 12th Five Year Plan of the GOI, NFDB guidelines for development support and in the spirit of FAO CCRF to ensure sustainable development of the sector while appreciating equity and environmental concerns.