**NAME OF CATEGORY: USE OF ICT FOR DEVELOPMENT BY NON-GOVERNMENT INSTITUTIONS**

**1. Coverage – Geographical and Demographic**

**(i) Comprehensiveness of reach of delivery centres**

India is on the threshold of a truly revolutionary era of discovery and information explosion. Empowering villages through knowledge and resource rich centers, providing the right array of opportunities, and creating appropriate action platforms for people and communities to exchange information and participate in meaningful development-one that is defined and shaped by their own communities, is the beginning of a journey of transformation. The Village Resource Centre (VRC) movement by M S Swaminathan Research Foundation (MSSRF) is located in this context of moving towards an inclusive knowledge society.

Village Resource Centres- Village Knowledge Centres (VRC-VKCs) is a pioneering intervention of exceptional promise exerting transformational impact across Indian communities. VRC-VKCs are the cornerstones for knowledge equity and participation, as the fishers and farmers are the key stakeholders in rural India and are affected by diversified issues connecting to their livelihood enhancement such as uncertainity of weather condition, erratic rainfall, risk and vulnerability in their occupation, lack of real time information services, market rates and poor uptake of government schemes and entitlements.

The pragmatic experience of MSSRF on VRC-VKC, growing trend of technology, dynamic needs of community and increasing number of users over a period of time enabled MSSRF to design the “trinity model of ICT action platform” to reach out larger community for enhancing the knowledge economy of resource poor community,. The trinity models complement each other, while each one together and on individual capacity can act as holistic and standalone model to ensure end to end solution addressing the livelihood needs and issues of the fishers and farmers along with e-governance services.

The VRC-VKC action platform leveraging best fit technologies as Model 1 in trinity attempts to address the demand driven locale specific needs through its physical structure. The VKC is the community owned and managed structure operated by the knowledge workers. Model 2 ICT based Action Platform is based on mobile telephony to connect villages virtually and this has progressed as a standalone model for spanning increased villages with real time information services and interfacing experts and fishers / farmers. It encompasses combination of approaches using mobile telephony for mediating knowledge transaction through exclusive thematic helplines, phone-in programme, sms, audio advisories, audio and video conferences. Modelthree focuses on reaching out to the populace in mass through GSM Based Solar Back up PA System, All India Radio, FM Radio and Community Radio in the rural area, where there is paucity of knowledge transfer .

The content pertains to agriculture, fisheries, health, education, and government entitlements, and disseminated through the aforementioned 3 models reduce risk and enhance economic benefit of the farming and fishing community. All these three models attempt to reduce the existing digital divide and knowledge gap while supplement each other with logical connection and reiterative processes.

MSSRF runs 16 VRCs, 67 VKCs and 9 virtual sites and 1057 villages on virtual mode. Every year the VRC-VKC action platform coveres more than 1.5 lakh users from 41 districts spreading across Tamil Nadu, Maharashtra, Odisha, Kerala, Andhra Pradesh, and Puducherry. This year, it reached 135569 users from 1154 hamlets across six states.

**Usage of VRC VKC services**

| S.No. | Thematic Area | Male | Female | Total |
|---|---|---|---|---|
| 1 | Agriculture | 21468 | 12827 | 34295 |
| 2 | Fisheries | 34406 | 2259 | 36665 |
| 3 | Animal Husbandry | 552 | 342 | 894 |
| 4 | Health and Education | 5000 | 6215 | 11215 |
| 5 | General | 30700 | 21800 | 52500 |
| | **Total** | **92126** | **43443** | **135569** |

**(ii) Number of delivery centres**

The programme manages 16 VRCs with 67 Village Knowledge Centres (VKC) and 9 virtual sites. The VRCs are spread across Tamil Nadu, Maharashtra, Odisha, Kerala, Andhra Pradesh, and Puducherry, across 41 districts, reached 135569 users from 1154 hamlets.

**(iii) Geographical**

(a) National level – Number of State covered: 5

(b) State/UT level- Number of District covered: 1

(c) District level- Number of Blocks covered: 94

Please give specific details

MSSRF runs 16 VRCs with 67 VKCs and 9 virtual sites in a hub-and-spoke mode. The VRCs spread across Tamil Nadu, Maharashtra, Odisha, Kerala, Andhra Pradesh, and Puducherry, across 41 districts, reaching 135569 users from 1154 hamlets.

**(iv) Demographic spread (percentage of population covered)**

MSSRF runs 16 VRCs with 67 VKCs and 9 virtual sites. The VRCs are spread across Tamil Nadu, Maharashtra, Odisha, Kerala, Andhra Pradesh, and Puducherry, across 41 districts, reaching 135569 users from 1154 hamlets.

**2. Situation before the Initiative (Bottlenecks, Challenges, constraints etc with specific details as to what triggered the Organization to conceptualize this project)**

The key production and technology issues that hinder Indian farmers from fulfilling their agricultural destinies are lack of real-time information and early warnings, poor access to new

technology, high cost of production vis-à-vis depressed yields, unavailability of inputs, high incidents of pest and diseases, soil degradation, and water scarcity crisis.

Fishing in India is conducted in traditional fishing crafts, motorized boats, and small mechanized crafts. The key issues leading to loss of fishing assets and life are unpredictable weather, uncertainty in fish catch due to decline in fish stocks, spoilage of fish due to unhygienic fishing practices, paucity of early warning, lack of scientific knowledge and skill in new fishing technologies and troubleshooting, crossing maritime boundaries, and unsustainable fishing practices.

The concept of VRC-VKC was conceived with pro-poor, pro-women, pro-nature and pro-jobled livelihood orientation to address the bottlenecks and challenges faced by the farmers and fishers in improving their livelihoods, diversifying their income sources, reducing their vulnerabilities, and providing them the 'currency' of the knowledge economy: last-mile connectivity, locale-specific, demand-driven, timely content, and linkages with ICT4D players.

The journey in the field of ICT enabled knowledge services among the community facilitated to evolve appropriate models capitalizing the latest trend of technology development. It helped to bring about trinity model of ICT based solutions to address the issues of fishing and farming community quicker and in time following the key approaches of (a) massive reach (b) targeted reach (c) Knowledge centre reach.

In order to address the challenges posed by the rural community, the models leverage multi stakeholder partnerships drawing experts from public private and community.

3. **Scope of Services/Activities Covered**(Extent of computerization in terms of number of services computerized, Process that have been re-engineered, Services which depends on these processes, Analysis/re-design of process workflows –before (as is) and after (To be) reengineering , level of automation (number of services computerized) #

Knowledge empowerment is the intrinsic principle underpinning the goal of VRC-VKC. With access to best-fit technology and timely, locale-specific, demand-driven knowledge, the fishers and farmers are enabled to bypass traditional stages of development and gain greater control over decision making resulting in empowerment, innovation, and economic prosperity.

The models promoted by MSSRF attempts to provide end to end solution to the fishers and farmers using appropriate technology. The capacity building initiatives are integrated on demand basis for translating knowledge into action. The following details present how fisheries and agriculture related services are provided to the fishing and farming community.

**Activities under Fisheries**

Shore to shore approach has been followed to support the fisher men from venturing to fishing till returning ashore. Augmenting and disseminating scientific and government information services from INCOIS, IMD, Fisheries department, MPEDA, NFDB, Indian Coast Guard, government departments form part of e-governance. Precise forecast information on weather, wave and wind speed in local language through mobile phones every day to a fisher enable him to decide the suitability and safety of venturing into fishing. Subsequent to the decision on going

forward, good fish catch in most cost effective and effective manner is essential, for which the fisher folk are provided with Potential Fishing Zone information, based on satellite remote sensing to navigate to the fish zone reducing search time, fuel expenses while securing assured catch.

To augment the fishing experience and ensure safety navigation on sea, the fisher folk are provided with training on GPS systems enabling them navigate precisely and safely to PFZ zones avoiding danger zones. The awareness on sea safety, first aid measures and trouble shooting for diesel engines help fishers to ensure safe fishing on sea. The programme on fish quality management, both on-shore and off-shore with market price information for men and women facilitates them to maintain fish quality and gain better market price. However the value of the fish catch is lower than the anticipation and fish species that are of low market value. The fisher women are trained on adding value to such fishes under the fish value added training program resulting in increased revenue. Thus the fisher friend programme supports fishers as a friend throughout the cycle of fishing profession to improve their life and livelihood.

The Fisher Friend Mobile Application designed as a one stop shop services provide a gamut of information and knowledge services to the fishing community in time. The information services provided through the android based application are ocean state forecast, potential fishing zone, tuna forecast, weather forecast, species and landing centre specific market rate, news flash, government entitlements and schemes, International Border Line alert, GPS with the facility to draw and save their navigation route on sea, marking risk zones and contact facility to connect with critical personnels during emergency and need of information.

Relevant fisheries related government schemes such as boat registration, subsidies for fishing technologies such as tuna longliner, GPS, eco sounder, sea safety kits, boat engines, fish holder, ice box, education related schemes for the children of fishers etc are facilitated through the VRC-VKC action platforms extending its awareness and enabling them to access it through on-line forms.

**Activities under Agriculture**

Several factors hinder farmers from fulfilling their agricultural destinies such as erratic and frequent weather change, insect and disease occurrence, large scale outbreak of fungal diseases, soil infertility, extraction and depletion of ground water, migration and labour constraints, presence of middlemen, lack of awareness and availability of farming techniques, less minimum support price, very limited irrigation facilities, lack of quality seeds, lack of awareness on pest & disease management in crops as well as cattle rearing.

Agriculture, being a complex system, the major issues of farming community alone are being addressed leveraging the existing schemes. Services related to land preparation, maintaining soil health management, crop cultivation and contemporary farming techniques, pest and disease management, integrated fertilizer management, and key information and knowledge services such as weather forecast, pest forewarning, market price, water management, and sustainable agricultural practices. The extension of Animal husbandry focused knowledge services are forewarning of epidemic outbreaks, care and management, quality milk production

etc.

**Plant clinics:** Plant clinics function as human clinic in villages offering precise, diagnostic and advisory services for plant diseases, helping create durable plant health systems for smallholder farmers in Tamil Nadu, Puducherry, and Maharashtra. The microscope connected with laptop help magnify the insects and pests in the crop sample brought to the clinic, act as value added information and eye opener for farmers to understand the type of issue that the crop is facing and relate with remedial measures. The experts in agriculture are connected through VRC and VKC programme using video / audio conferencing, and phone in programmes, to address issues related to seed treatment, pest and disease, fertilizer application, and water management.

**Knowledge on Wheels:** Soil health and water quality are the most crucial factors in farming. The Mobile Soil and Water Testing Laboratory (MSTL) travels to fields to perform tests and distribute soil health cards with test results and experts' recommendations. The regular analysis since 2005 shows a positive change in the soil health. The main highlights were that there was an increase in the organic carbon content, microbial load, and the pH has become neutral, contributing to environmental sustainability.

**Livestock health care** is ensured through ICT platforms extending appropriate interventions related to care and management, in which quality milk production, fodder management, artificial insemination, disease management inputs are provided through video / audio conferencing, phone-in-programmes, and short messages.
Relevant agriculture related government schemes such as crop insurance, subsidies for farm implements and modern technologies, water management techniques, seeds, inputs etc are facilitated through the VRC-VKC action platforms extending its awareness and enabling them to access it through on-line forms.

The digital capacity of rural folk are built to enable them access need based information and knowledge services.

**Process**
Appropriate interventions are implemented undertaking participatory exercise of periodic need assessment identifying knowledge gaps and capacity requirement of the rural communities , in collaboration with relevant partners. The synchronous tools enable real-time communication between communities and experts in a 'same time-different place' mode, while asynchronous tools ('different time-different place' mode) foster collaboration and collective growth of capabilities over a period of time. In this manner, rural men and women are able to seek critical information, discuss with experts, and clarify doubts. Based on this, communities are empowered to take informed and timely decision, reducing risk and vulnerability, and thereby helping to maximise economic return.

Number of e-governance services such as appropriate formats for accessing government schemes and entitlements other than agriculture and fisheries such as birth, death, community certificate, education and health related schemes etc are packaged through entitlement passbook and made available through VRC & VKC programme.

4. **Strategy Adopted**

(i) The details of base line study done,

Baseline study was conducted using different methodologies such as questionnaires for both farming and fishing communities, focus group discussions with key stakeholders, and participatory rural appraisal methods like seasonality mapping, venn diagram, and problem tree analysis and secondary data collection.

The key areas of baseline study focused on demographic, socio and economic status of every household, crop / fishing pattern and practices, existing issues, access to information and knowledge and its current source, available technologies, processing facilities, existing linkages with line departments and other critical knowledge services, access to government schemes etc.

(ii) Problems identified

Given the condition of occupation, literacy, and ethnicity, the scenario is distinct and diverse state to state. In Tamil Nadu and Puducherry, the percentage of literacy rate is high in agriculture based villages than in fishing villages, while it is poor in Odhisha (due to ethnicity) and Maharashtra.

Despite livelihood specific existing predicament was found among both fishers and farmers, the following commonalities characterized the baseline:

- Poor access to modern technology for getting information in all the areas .
- Gender disparity in access to technology adds volume to the existing state.
- Poor access to early warning, scientific and general information and knowledge services including the reach of government schemes and research outputs

**Fisheries**

They are very many, as pointed out in the FAO paper “Social issues in small-scale fisheries” Poverty, harsh living and working conditions, Weak organisational structure, no social security, Lack of access to credit, particularly public finance, dependence on exploitative moneylenders, Hazard to life and limb at sea through fishing vessels that lack basic safety standards and safety equipment, Vulnerable to floods and cyclones, and to the vagaries of climate change, Exclusion from access to other employment opportunities, to health and social services, to roads, markets and other infrastructure, Excluded from participation in social and political processes, and in development planning, Diminishing fish stocks and biodiversity, Increasing competition with other users of coastal resources, conflicts with the industrial fishing.

A string of reasons involving low levels of awareness and exposure to latest technologies, lack of technical know-how and access to proper trainers and an aversion to interface with technology which is completely in English were found as reasons for fishermen not adopting technologies in wide scale. The aforementioned issues have prevented fishermen taking up fishing away from near coastal waters due to lack of navigation aids. In certain parts of southern Tamil Nadu,

paucity of proper navigation aids resulted fishers often stepping into Srilankan waters resulting in loss of life and capture.

Dwindling fish stocks in near coastal waters also forced traditional and artisanal fisher folk to venture into deeper waters away from continental shelf in order to explore zones where the catch have traditionally been underexploited. In this changing scenario the fisher folk are handicapped due to lack of access and knowledge on the know-how of proper navigation aids and technologies that enable them to venture into deeper waters safely, mark fishing zones and to plan fishing trips.

One of the biggest sea safety issues and nightmare faced often by small craft fisher folk is the failure of fishing vessel engine in high seas resulting fishers drift in the sea for a long time without any food, water and other safety measures. Cut away from the rest of the world in terms of communication the above scenario, fishers in most cases experience loss of life or missing in the sea for a number of days together. Lack of awareness and knowledge on basic maintenance procedures since it was not followed for outboard motors, it resulted in constant repairs and failures.

Livelihood is affected till the engine problems are rectified. Lack of skilled and trained mechanics at the local level who can identify and resolve issues, leading to seek technical support from far away areas, which are expensive. Unhygienic practices during fish catching, sorting, icing and processing in the sea leads to spoilage of fish, resulting in economic loss for fisher folk leading to poverty among the fishing community. According to Food and Agriculture Organization (FAO) about 10-12 millions tones of fishes are lost annually to spoilage due to unhygienic fishing practices both in fish catching as well as in the processing. To reduce the spoilage and to enable fisher folk to realize the full economic potential of their catch, proper training and appropriate linkages are required.

**Agriculture**

The discussion with farmers unveiled that they face new and severe challenges such as lack of guidance about location specific and market oriented crop and variety selection, unreliable water resources, poor water management practices, lack of knowledge about government schemes and subsidies, lack of information about weather and rain, uncertain rainfall an temperature regimes lead to outbreak of new pest and diseases, lack of knowledge to control the insect, diseases, weeds and nutrient deficiency problems, poor knowledge on forward market linkages, no demonstration lots for new farm technologies, ever depleting water tables, age-old improper cropping practices, overdose of plant protection chemicals and lack of knowledge on drought alleviating measures and contingent cropping programs resulted agriculture as commercially unsuccessful.

The higher input cost and poor marketing facilities plague the farming community and many of

our farmers are unaware of the daily market price and often depend on middle men and brokers who work on an established net work and quote same low price in invariably all markets. The poor connectivity between the producers and consumers at the end of supply chain, selling of produces at the production point at unbelievable low rates, lack of agri loan at low interest, dependency on private money lenders at an interest rate of 2% average, lack of timely procurement with assured MSP ( Minimum Support Price),

About 84% of land holding are of less than 2 hec i.e., small and marginal farmers and treated as most disadvantaged groups by financial institutions and they lack access to major agricultural services such as credit, extension, insurance and marketing. The other structural challenges are declining soil fertility and depleting ground water and power shortage.

The yield stagnation in major crops, lack of affordable improved seeds and non availability of extension services are treated as agronomical challenges. Significantly traditional crops are replaced by commercial crops because of the market forces resulted in huge consumption of pesticides, fertilizers, seeds, and transport cost.

The ever rising input cost, meager increase in output price, poor knowledge on post harvest operation, poor storage facilities are also treated as major obstacles. The higher cost of farm machineries and poor agricultural machineries renting system and absence of workshops exclusively for farm machineries turn farm mechanization still unreality.

(iii) Roll out/implementation model,

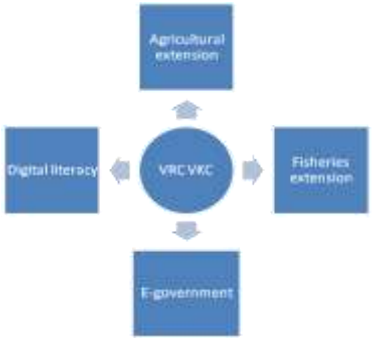
Bottom up approach with pro-poor, pro-women, pro-nature and pro-livelihood orientation is followed. The Village Resource centres and Village Knowledge centres (VRCs-VKCs), leverage best-fit Information and Communication Technologies (ICTs), and function as a conduit for information, knowledge, and skill transfer to rural communities. They bridge the knowledge, gender, and digital divides and empower the rural community by fostering participatory communication through lab-land, land-lab, lab-lab and land-land approaches. Village Knowledge Centres are managed by the rural community.

Each model among the trinity of ICT action platform acts as a catalyst to bring about the intended changes, while it acts as standalone model in itself for replication. Example, helpline, sms services, audio advisories, phone in programmes are followed exclusively as a model to connect fishers and farmers in rural areas. A number of philantherapic and corporate organization both nationally and internationally replicated the model, while MSSRF has scaled it across 6 states to benefit more than 1000 villages as of now from a few villages of a single union territory in 1998.

The alliance formed through Mission 2007: Every Village a Knowledge Centre exacerbated the ICT based interventions by multi stakeholder including central government. Many stakeholders appreciated the model and an Impact Assessment study by National Council of Applied Economic Research (NCAER) recommended to the government that "IMD could also visualize a Farmers' Friend Programme on a pilot scale along the line of the M S Swaminathan Research Foundation's Fisher Friends Programme to institutionalize the NGO Intermediation process in dissemination of weather information." http://dod.nic.in/ImpactAssessment-MOES.pdf

(iv) Communication and dissemination strategy and approach used.):

Bottom up approach eliciting community partnership with pro-poor, pro-nature, pro-women approach is followed across the villages. A synergy of effective community-based strategies is deployed in impacting the community. gender sensitive approach, advocacy and networking with Panchayati Raj institutions and partners, institutional and capacity building, demand driven and locale specific information in time, knowledge products, research and development, community ownership, and continuous handholding, knowledge and skill transfer through strategic partnerships are the key approaches followed for effective knowledge dissemination.




A local and dynamic knowledge ecosystem is undergirded by a gamut of best-fit, synchronous, and asynchronous ICT tools to develop innovative applications and technological solutions as intelligence and decision making support system for rural communities to address agriculture and fisheries related issues The synchronous tools enable real-time communication between communities and experts in a 'same time-different place' mode, while asynchronous tools ('different time-different place' mode) foster collaboration and collective growth of capabilities over a period of time.The asynchronous tools include Mobile-based audio and text advisories, Fisher Friend Mobile Application (FFMA), helplines (fisheries, agriculture, and animal husbandry), electronic display boards, Global System for Mobile Communication (GSM) based public address system and notice board, "*Namma Ooru Seidhi*" (community newspaper), Knowledge Management System (KMS), resource materials (manuals, handouts, booklets and posters) .

The synchronous tools include phone in programmes, video and audio conferences, FM radio for facilitating discussion and land-lab knowledge transfer; on-site training programmes (e.g. farm school) build and strengthen the capacity of farming community.

5. **Technology Platform used**

**(i) Description**

A local and dynamic knowledge ecosystem is undergirded by a gamut of best-fit, synchronous, and asynchronous ICT tools to develop innovative applications and technological solutions as intelligence and decision making support system for rural

communities.

The asynchronous tools include Mobile-based audio and text advisories, FFMA, helplines (fisheries, agriculture, and animal husbandry), electronic display boards, Global System for Moblie Communication (GSB) based public address system and notice board, community newspaper, KMS, resource materials (manuals, handouts, booklets and posters)

The synchronous tools include Phone in programme, video and audio conferences, FM radio for facilitating discussion and land-lab knowledge transfer; on-site training programmes (e.g. farm school) build and strengthen the capacity of farming community.

Technologies used for knowledge dissemination through synchronous and a synchronous tools are as follows:

Internet connectivity (512 kbps to 4 mbps) with wireless network (IEEE identified 802.11 b/g with the scope of high line speed 11 Mbps and the 54 Mbps) covering unidirectional (360 degree) and line of sight (30 km), VHF using GM300 and ST869 interface board, multi bridge video conferencing RMX 1500 , oovoo and skype based video conferencing, Wireless Public Address System - 2.4 Ghz Direct Spread Spectrum Technology with Audio integration using 2.4 GHz Radio Tx-24 & RX-24, GSM based Closed User Group Fixed Wireless Phone for audio conferences, Android mobile phones, 3 G video conferences and WhatsApp.

The synchronous tools enable real-time communication between communities and experts in a ‘same time-different place’ mode, while asynchronous tools (’different time-different place’ mode) foster collaboration and collective growth of capabilities over a period of time.

**(ii) Interoperability**

- Information is exchanged between client and server in standard XML format over HTTP for the entire technology based services.
- FFMA Portal viewed in standard compatible web browsers like Chrome, Firefox, IE. Also compatible with various operating systems such as Windows, Macintosh and Linux and devices such as PC, Tablets and mobile phone . similar features are followed for KMS, MIS and transferring audio messages.
- Application compatible with small and medium size Android devices till date and extending to large size devices like tablets.

**(iii) Security concerns**

Different levels in which data security is ensured. First level fencing is done using firewall (sonic wall 2400) for avoiding hackers, second level ensures data secured from spam, virus and moleware using antivirus (barracuda anti spam virus fire wall and k7 antivirus enterprise edition) and SANstorage for ensuring data security within.

Appropriate back up facility for server and data, and redundancy power and data are

ensured towards data security when natural disasters occur.

Data exchange between land to lab and lab to land, and land to land is ensured signing and following appropriate MoU.

**(iv) Any issue with the technology used**

- Application is specific to Android platform and runs on 4.0 + only.
- Time schedule for voice message dissemination as per TRAI rules
- GSM Based technology functions in area where network coverage is there
- Connectivity reach on sea is within 12 nautical miles Paucity of 3G network and its strength in rural areas

**(v) Service level Agreements(SLAs) (Give details about presence of SLA, whether documented, whether referred etc. #)**

NA

**6. Adherence to Service Level Agreement (SLA)** – Give details about presence of SLA whether documented, whether referred etc, certificate from user department is mandatory #)

NA

**7. Citizen Centricity** (Give specific details on the following#)

**(i) Impact on effort, time and cost incurred by user,**

The initiatives facilitated to generate huge impact among the resource poor community including women. Large quantum of women, farmers and fishers benefitted through the services. E-governance services through ICT enabled fishers and farmers to gain benefits to ensure economic and livelihood wellbeing.

The ICT models spread across Tamil Nadu, Maharashtra, Odisha, Kerala, Andhra Pradesh, and Puducherry, across 41 districts, enabled 135569 users from 1154 hamlets access the information and knowledge related to fishing, farming and e-governance.

**Impact realized by Fishers**

The potential of mobile phone technology leveraged in disseminating timely, critical advisories to small craft fishers brought out significant changes in the lives of fishing community. They are as follows:

**Multilingual 24/7 fisheries helpline services**

The helpline played a major role not only in providing regularly the crucial information services to the fishers, but also as a nodal point of communication for fisher folk during the emergency and disaster situations. It brought forth the below stated benefits:

- 93 fishermen have been saved from life-threatening maritime distress through 24X7 helpline, and networking with the coastguard and local communities (2011-2014).
- During the Earth Quake in Indonesia (April 11, 2012), Neelam, Thane, and Payalin cyclones, helpline facilitated fishers to be updated with continuous intimation of

cyclone movements with the support of INCOIS scientists and enabled them take appropriate decisions for life and asset safety. About 2350 fisher folk used the helpline to get the status of cyclone movement and benefited.

- It serves as a source to Fisheries Department Officials from Tamil nadu, Puducherry and Andhra Pradesh as they consult Helpline and update their warnings based on the advisories provided.

**Appreciating the systemic services of MSSRF in disaster situation, Dr. Balakrishnan Nair, INCOIS, said "Not a single fishermen ventured out to sea. Organizations like MSSRF took the pains to disseminate the information to the fishing community along the Tamil Nadu Coast in the DNA press, Jan 5, 2012. http://www.dnaindia.com/print710.php?cid=1633859**

**Technology, a lifeline for lost fishermen**

A fishing boat from Kasimedu in Chennai with a crew of 10 fishermen on board drifted into the sea on November 29, 2013 due to rough weather. The first few days, the boat could not be traced in spite of the best efforts of AD Fisheries and the Indian Coast Guard. Fortunately, the crew managed to connect through mobile phone to their boat owner who was on the shore and the owner tracked that the boat had drifted to international waters and contacted MSSRF Helpline, which in turn took the help of multiple players including Indian Coast Guard (ICG). With guidance on directions from the Helpline, fishermen and ICG, the fishing boat with the entire crew reached shore safely on 10 December 2013.

**Audio Advisories**

Real time audio advisories act as timely support for decision making and plan fishing activity. It minimizes risks and maximizes economic and social benefits. The fishers decide about venturing into the sea for fishing based on the audio advisories and thus avoid human and economic losses.

Born in a 8 sibling family, lost father in tsunami, Mr. Kuttyandi, a 28 year old fisherman with the education till tenth is in fishing profession. The 8 yr experienced fisher, own an FRP boat, a mobile phone, and gill nets, and recollects the power of technology in providing OSF and PFZ translating its effect to safeguard life relating it to an incident held 3 years back, which is a death of 4 fishermen in Pushpavanam due to lack of early warning. Due to PFZ information, he caught 130 kilos of seer fish in a day catch, and sold it for Rs. 400 a kilo leading to a gain of Rs. 50,000. He shared his bitter experience on the loss of input costs of Rs. 30,000 a month, without a catch leading to frustration, despair, and economic distress.

About 2000 fishermen received awareness about boat registration with MPEDA out of which 200 fishermen have registered their boats. 52 fishermen from Nagapattinam have received subsidized GPS equipment from MPEDA. 75 fisherfolk have received tuna long-liners. Under ATMA, 82 fishermen have received subsidized GPS unit.

**An entire village shows the way! Bottom trawling to gill netting (study report annexed)**

Gilakaladindi, an entire coastal fishing village in Krishna district, Andhra Pradesh, has changed its practice from bottom trawling to pelagic fishing using gillnets, due to the MSSRF information services. By using PFZ advisory, the fishers were able to catch a minimum of 500 kg of tuna in one haul. After meeting expenses, a trawling boat owner gets around Rs 7500-10000 whereas the gillnet owner earns Rs 15000-20000 from a single fishing trip due to reduced fuel expenses (1000 litres to 400 litres).

Due to increased harvest of fish resources of good market potential, there has been a rise in the wages of the fishing crew as well. Spouses of the labourers engaged in gillnetting are happy that their men are able to spend more time with their families now due to reduced time at sea. The women expressed that the health of their men is much better now than when they were engaged in bottom trawling.

The project has achieved several behavioural changes in the fishing community.

The Knowledge on marine biodiversity conservation through various mobile technological platforms exerts an impact on the impressionable minds of youth. The rising generation of fishers has become conscious of the importance of bio resources conservation after listening to the audio advisory on sustainable fisheries and marine biodiversity conservation. They are cautious not to pollute or deplete the oceanic resources as evidenced through their restraint in throwing plastic into the oceans, in reduced juvenile capture, and their initiative in returning egg-carrying females and juveniles to sea. In 3 of the fishing villages in Tamil Nadu the fisher youth members took a vow that they would never throw plastic material in the sea while one group promised that they would be dedicated in returning sea turtles to the sea.

Phone in programme provided opportunity to the fishermen to interact with subject matter experts directly without inhibitions and obtain answers and clarifications. The fishermen really appreciated this programme because it enabled them to access and interact with experts. The information empowerment and the know-how to translate information into action enhanced improved their fishing productivity and self esteem. Fishermen receive actionable inputs on juvenile protection so as to not deplete oceanic fish stock. The potential fishing zone information promotes sustainable fishing.

**Next generation impact**

Fishing is often an ancestral occupation and youth are initiated into it at a young age. Extensive ICT-based educative sessions are conducted in schools to awaken their minds and hearts about the big picture of marine biodiversity conservation.

**Agriculture**

S.Arunachalam, farmer in Pasupathikovil, brought the crop sample of Gingelly crop, attacked by Jassids and wilt disease attack. The timely diagnosis and appropriate remedial measures, he was relieved from 30% yield loss. He could recover the crop in 10 days and gained get

the extra yield of 60 Kgs in Half acre, other than the average yield of 250 kg/acre

Mr.S.Kannalagan, Panaiyur, in Thanjavur district, has 15 yrs of experience in farming. He cultivates Paddy, Blackgram, Gingelly and Maize crop according to the seasonal conditions. The advisories on fertilization application and pest management helped him avoid crop loss when he raised maize crop in 5 acres of Chitthiraipattam. He harvested 60tonnes of grain yield. The information on market price of Rs.1950/- helped to sell in regulated market at Ariyalur and saved labour charges for loading, unloading, transportation cost, upto Rs 5,000/ while giving higher price

Mr.Subramani, Iyyankutipalayam in Pudhucherry, after attending the trained on coconut climbing, earn about Rs. 300 to 400/day after all his expenses. Similarly Mr.Senthilkumran, Pudukuppam also earned so far Rs. 1000 by climbing nearly 20 trees a day. Ms. Chithiraiselvi in Dingigul district started it as an enterprise earning more than 300 a day.

Significant improvement is found in soil health due to the constant efforts. Salinity, alkalinity, poor organic carbon and nutrient status characterise the soil state in villages of Thiruvaiyaru and Pudukottai. The mobile soil testing laboratory (MSTL) selected problematic soils and convinced the farmers to consistently test their soil samples for major nutrient status. The results showed an increase in organic carbon in the fields, from 0.43 to 1.08, nitrogen from 59.3 to 98.8 kg and potassium, from 66.4 to 142 Kg. The overall results clearly indicated an increase in soil health. The precise, need based recommendation of fertilizer dosage, based on the results of soil analysis, reduced the farmers' production inputs and avoided accumulation of toxic residues in the soil.

The recurring cost includes the cost components of human resource, maintenance of equipments, connectivity and communication, content development, dissemination and social mobilization.

The user cost per day Rs 188 and the user cost per year is Rs 67792 for the entire gamut of service being rendered to the farmers and fisher folk. They receive timely, life-saving, risk-reducing, livelihood-enhancing inputs, using the best-fit ICT tools, through the set up a sustainable architecture of community-based information entrepreneurship centre. The feedback indicates the immense value of the services and the interventions through the communities' satisfaction and gratitude.

**(ii) Feedback/grievance redressal mechanism,**

The feedback system is established at the community and partner levels.

The community has been involved in every stage of the project cycle, including integration of iterative feedback to evolve service delivery and enhance knowledge empowerment. The Fisher Friend Mobile Application stand as an example for designing a service delivery based

on feedback mechanism. Community play a crucial role in carving this user friendly tool.
Both fishers and farmers play a major role to share their views on the accuracy and adoptability of the information and knowledge services, which in turn helps to build land-lab communication for rectifying the same exploring the refinement through research and modeling.

The periodical discussion, user interaction to elicit feedback facilitates to spot out the challenges, key learning and areas of improvement for course correction. Helpline services help fishers and farmers to address their needs in time with care. Feedback from fishers on accuracy of information is subsequently directed to the users, so as to find out solution to the issue.

**(iii) Audit Trails,**

A logical framework approach developed forms the base for audit trails of measuring the progress of the project against stated goals and objectives. While the in-built monitoring mechanism in the best-fit technologies facilitates obtaining quantitative data against objectives, the periodic discussion with community sets the pathway for bringing about change in the functioning and service delivery model, design of technology and accuracy of the contents disseminated.

The regular meetings organized with boundary partners at the community and VKC Management Committee levels help them audit the performance of VKC and suggest strategies for its improvement.

Stakeholder meetings and periodical assessment with fishers and farmers through interviews, questionnaires, focus group discussions, and case studies helps collate the qualitative changes in risk reduction and income enhancement. Mid-term evaluation of the project regulates implementation and its processes and adoption of corrective measures to ensure effectiveness in the reach of services.

**(iv) Interactive platform for service delivery,**

The synchronous and asynchronous tools used facilitate to connect fishers and farmers to the e-governance services related to livelihoods. In fisheries, the existing schemes and research outputs are disseminated using these platforms and with appropriate discussions with the concern experts.

**Physical Structure for knowledge interface**

Established in a hub and spokes model, the VRC-VKC is a composite of demand-driven, interactive, ICT-based action platforms which strengthens the land-land, land-lab linkage, reduces knowledge gap, and fosters social inclusion. The VRC-VKC model also functions as a tool for mediation of partnerships between governmental, scientific and technical organizations, and rural societies.

**Fisher and Farmer Friend Programmes** of M S Swaminathan Research Foundation in the 6 states of India acts as a catalytic and real-time decision making support system for resource poor fishing and farming community.

The models designed by MSSRF foster interaction between scientists / researchers / experts and farmers / fishers / general rural community to enhance knowledge, reduce digital divide and thereby enable them reduce risks and enhance socio-economic wellbeing.

**Fisher Friend Mobile Application**

The FFMA is a pioneering single window solution with an interface with research institutions to sources scientific information and facilitate fishing community receive dynamic shore-to-shore information. . It runs on mobiles with Android platform, in Tamil, Telugu and English. It empowers fishers with real time access to crucial information on potential fishing zones (PFZ), ocean state forecasts (OSF), disaster alerts, market data, government schemes and entitlements, emergency contact numbers, and international maritime border alerts.

Due to its relevance and interactive nature, FFMA received mBillionth South Asia Award 2014 and was highlighted as one of the cases in the India Human Development Index 2011 (Page 219) which "saves lives…enhances livelihoods…increases knowledge base by providing updates on government schemes, policies and developments of interest to fishing communities."

FFMA was also showcased by Governance Knowledge Centre promoted by the Department of Administrative Reforms and Public Grievances as an effective public service delivery through innovative governance service knowledge exchange that helps fisherfolk make better choices and avoid hazardous situations.

**ICT-based knowledge package**

When need based audio / text information and knowledge services are provided to the farmers, fishers, SHG members, and other community members using mobile phones, for timely decision making, exclusive helplines for fisheries (24/7), animal husbandry, and agriculture have been established to lay an interactive platform for addressing their questions. Phone-in programme, a theme / season based programme, enables the rural community to interact with subject matter specialists to get clarifications for their doubts, and seek guidance and advice to improve their lives and livelihoods.

While helplines appreciates addressing specific questions, other platforms like phone-in programmes and audio conferences encourages in-depth discussions between experts and farmers / fishers, and thereby intensify the role of interactive platforms in knowledge enhancement.

**Capacity Building** through audio and video conferences extends platform for direct discussions with experts on the specific subject. Also the farmers and fisherfolk receive training programmes with hands-on components focusing on integrated pest and disease management, integrated nutrient management, livestock care and management, latest farming techniques and technologies, leveraging market realities, weather forecasts, quality

fish management, handling technologies, sea safety measures, and value added products

**Plant clinics:** Plant clinics act as a an ICT platform to facilitate discussion between experts and farmers and realize the real time problems in the crop through microscope connected laptops.

The audio video conferences address issues related to seed treatment, pest and disease, fertilizer application, and water management.

**Knowledge on Wheels** enables interactive platform equipping farmers to understand soil and water sample techniques and provide soil health cards with test results and experts' recommendations. The regular analysis since 2005 shows a positive change in the soil health.

**Livestock health** is ensured through appropriate interventions related to care and management, in which quality milk production, fodder management, artificial insemination, disease management inputs are provided through video / audio conferencing, phone-in-programmes, and short messages.

**(vi) Stakeholder consultation**

Stakeholder consultations are organized at the community, district, and state levels to engage iteratively. Regular stakeholder engagement process at different levels is seamlessly woven into the entire project cycle. Systematic approach has been followed at the community level to integrate fishers as a key stakeholder throughout the entire project cycle of planning, implementation, monitoring and evaluation to refine the project interventions as well as ensure that the project benefits fishers. Example, the Fisher Friend Programme A State level Stakeholder workshop (2014) captured the benefits of PFZ and OSF (FFMA). Fishers expressed that their tuna catch had increased from 4 tons to 15 tons per trip, valued at Rs 25 lakhs in the PFZ locations; they were saving on diesel cost and the time at sea had come down from 10-15 days to 4-5 days. This has resulted in the intangible benefit of spending more time with the family due to quick return from fishing.
Similarly the discussion with plant doctors in farming helped to identify the decreased input cost and incidents of pest and disease ratio in their crops due to timely knowledge and application of remedial measures.

Stakeholder meetings at the local panchayat level, district, and state level are convened to critique the project and their feedback is elicited to dynamise the project. Strategic content and capacity building partners from the scientific community, boundary partners, and policy stakeholders are also engaged in the strategic and tactical refinement of the project for both fishing and farming.

At the strategic level, periodic discussion with partners who rendered their support from line departments, research and academic institutions are done to share the benefit of services and areas of improvement in reaching out community. This platform also play a role for getting their critical comments for improving the quality and service delivery system, while play a role to influence policy. Example, the discussion with INCOIS enabled to port the data

directly into the Fisher Friend Mobile Application for scaling it across the coastal state of our Nation. The same way, the discussion on plant clinic at the Secretariate level paved way for embedding it into the agriculture interventions in Tamil Nadu.

**8. User convenience** (Give specific details about the followings #)

**(i) Service delivery channels (Web, email, SMS etc.)**

A local and dynamic knowledge ecosystem is undergirded by a gamut of best-fit, synchronous, and asynchronous ICT tools to develop innovative applications and technological solutions as intelligence and decision making support system for rural communities.

The asynchronous tools include Mobile-based audio and text advisories, FFMA, helplines (fisheries, agriculture, and animal husbandry), electronic display boards, Global System for Moblie Communication (GSB) based public address system and notice board, "*Namma Ooru Seidhi*" (community newspaper), KMS, resource materials (manuals, handouts, booklets and posters)

The synchronous tools include Phone in programme, video and audio conferences, FM radio for facilitating discussion and land-lab knowledge transfer; on-site training programmes (e.g. farm school) build and strengthen the capacity of farming community. The synchronous tools enable real-time communication between communities and experts in a 'same time-different place' mode, while asynchronous tools ('different time-different place' mode) foster collaboration and collective growth of capabilities over a period of time.

Public, Research and Academic institutions realized the value of VRC-VKC action platforms and are sending the crucial and critical information to the VRC & VKC for dissemination. Examples, IMD weather information, INCOIS, OSF & PFZ information, Employment exchange also share the information for wider reach through these platforms.

**Fisheries:**

- 12358 users receive two audio advisories per day on fisheries and more than a lakh per annum.
- 6 dedicated 24/7 multi lingual fisheries helpline in Tamil, Telungu and Malayalam caters to 1000 fishers on an average per day. Thus far 16353 fishers benefitted through helpline.
- 26791 fishers obtained training on fisheries related aspects as stated below through capacity building during April 2013 to July 2014

| S.No | Topics | Male | Female | Total |
|---|---|---|---|---|
| 1 | Awareness on PFZ, OSF, tuna forecast, Helpline | 14363 | 934 | 15297 |
| 2 | FFMA training | 4243 | 0 | 4243 |

| | | | | |
|---|---|---|---|---|
| 3 | Sustainable fishing practices | 1460 | 37 | 1497 |
| 4 | Sea safety measures | 1554 | 156 | 1710 |
| 5 | GPS and troubleshooting | 840 | 0 | 840 |
| 6 | Diesel engine and troubleshooting | 140 | 0 | 140 |
| 7 | Quality management of Dry fish | 0 | 185 | 185 |
| 8 | Fish quality control, value addition, hygienic handling of fishes –Onshore | 1549 | 715 | 2264 |
| 9 | Quality control of fishes - On sea | 615 | 0 | 615 |
| | **Total** | **24764** | **2027** | **26791** |

**Agriculture : ICT tools and coverage in Agriculture**

| Programmes | Male | Female | Total |
|---|---|---|---|
| Helplines | 999 | 659 | 1658 |
| Audio advisories | 3083 | 1116 | 4199 |
| Audio conferences | 1183 | 754 | 1937 |
| Phone in programmes | 1094 | 652 | 1746 |
| Trainings | 10877 | 8403 | 19280 |
| Video conferences | 442 | 478 | 920 |
| Plant clinics | 2603 | 458 | 3061 |
| Soil and water test | 1187 | 307 | 1494 |
| **Total** | **21468** | **12827** | **34295** |

**Training programmes in Agriculture**

| Topics | Male | Femal e | Total |
|---|---|---|---|
| Soil testing and fertilizer management | 2450 | 2707 | 5157 |
| Seed treatment and irrigation | 1335 | 946 | 2281 |
| Pest and disease management | 477 | 280 | 757 |
| Value addition and storage | 103 | 140 | 243 |
| Best-fit technologies, helpline, insurance | 6512 | 4330 | 1084 2 |
| **Total** | **1087 7** | **8403** | **1928 0** |

**(ii) Completeness of information provided to the users**

The systematic process adopted by MSSRF for its ICT enabled services ensures that the information provided is complete in terms of each of the services with quality as well as fulfills the needs of the community.

The baseline sets the tone for understanding the existing scenario in both fishing and farming. The disadvantageous position of resource poor farming and fishing community in getting timely information and knowledge services for appropriate decision making on early warning, weather and climate variables, short messages related to government schemes and day to day livelihood information requirements, market information, contemporary fishing and farming techniques etc are elicited. Appropriate information delivery mechanism is built using synchronous and asynchronous tools to disseminate timely information and facilitate interactive platforms for ensuring in-depth knowledge for action among fishing and farming communities.

The focus of Village Resource centres and Village Knowledge centres (VRC-VKCs) in agriculture and fisheries is to facilitate equitable penetration of information and knowledge among households from socially and economically marginalized rural communities, to reduce their risk and vulnerabilities and maximize economic benefit. VRC-VKCs develop the human resources of the rural communities by skilling them in ICTs, and foster a spirit of entrepreneurship through access to knowledge.

The design of the programme through different models including VRC-VKCs provide holistic end to end extension solutions in fisheries and agriculture, providing seasonal, timely, relevant, locale-specific information and knowledge, which enhance economic opportunities and reduce vulnerability among fishers and farmers.

**(iii) Accessibility (Time Window)**

The discussion with the community using participatory approaches helps the programme to understand the convenient time of the rural community. Hence based on the time schedule, the contents will be disseminated and similarly, the other services are extended counting their availability in a way to facilitate them participates actively and benefit out of it.

The experience evince that the time varies across each segment of the community. Women prefer different time due to their triple role of productive, reproductive and community based tasks. In some of the locations, due to religious and cultural reasons, they prefer different timing in VKC or exclusive meeting for them alone without mingling with men for learning life and livelihood related aspects. Fishers require different timing across districts due to the varied pattern of their venture into sea for fishing. Hence the time is adjusted according to their convenice while addressing their needs. Helpline experience of fisheries shows that mid night callers are huge due to the type of occupation, whereas the agriculture and animal husbandry records queries mostly during daytimes.

**(iv) Distance required to travel to Access Points**

Most of the services are provided using best fit technologies of synchronous and asynchronous tools, reaching the services to the fingertips and doorsteps of the communities, not requiring the beneficiaries to travel. The communities are required to travel only to

physically access the VRC-VKC to participate in videoconferences, and to utilise the content databases / engage in face-to-face discussions with experts. Located centrally amidst a cluster of villages, the centres remain within a radius of 5 kms accessible distance.

Cluster approach combining number of villages, which are in a closer proximity to each other is also followed to reduce the travel time of users when they need to participate in video conferences.

**(v) Facility for online/offline download and online submission of forms**

The VRC-VKCs enable communities to interface with the government departments, in online and offline mode.

Communities leverage benefits and subsidies by gaining online access to agricultural government schemes and entitlements such as crop insurance, ATMA, National Agricultural Development Programme, water, seed village, micro-irrigation, purchase of implements, horticulture, Kisan credit card, farmers cards, linkages between producers societies and marketing departments of Government. Online submissions of employment renewals, electricity bills, telephone bills and citizenship documents such as community certificate, nativity certificate etc. are also processed at the VRC VKC.

Example, in fisheries, about 2000 fishermen received awareness about boat registration with MPEDA out of which 200 fishermen have registered their boats. 52 fishermen from Nagapattinam have received subsidized GPS equipment from MPEDA. 75 fisherfolk have received tuna long-liners. Under ATMA, 82 fishermen have received subsidized GPS unit. Fishermen are also assisted to receive benefits of children's education schemes, renewal and application of passport, government schemes online and through the offline database, TNPSC examinations, submit college applications, open bank account and pay electricity and telephone bills.

The following table shows the details of government schemes realized by the rural community:

| No | Schemes details | Male | Female | Total |
|---|---|---|---|---|
| 1 | Received coconut clamber at free of cost ( each clamber cost is Rs.400) | 468 | 132 | 600 |
| 2 | ID card for physically challenged persons | 127 | 63 | 190 |
| 3 | Trip, sprinkler and minor irrigation | 326 | 63 | 389 |
| 4 | Crop insurance | 824 | 126 | 950 |
| 5 | Agri implements | 462 | 21 | 483 |
| 6 | Seeds and other inputs through subsidy | 239 | 63 | 302 |

| | | | | |
|---|---|---|---|---|
| 7 | Medicine for TB patients | 32 | 13 | 45 |
| 8 | Unemployment assistance through employment office | 147 | 97 | 244 |
| 9 | Employment registration and renewal | 65 | 23 | 88 |
| 10 | Marriage assistance and other welfare schemes | 00 | 321 | 321 |
| 11 | Maternal benefit through health department | 00 | 29 | 29 |
| 12 | Education loan | 89 | 112 | 201 |
| 13 | Old age pension | 231 | 316 | 547 |
| Total | | 3010 | 1379 | 4389 |

**(vi) Status tracking**

A logical framework approach is adopted to monitor and evaluate the progress of the project against stated goals and objectives. The in-built monitoring mechanism in the best-fit technologies facilitates obtaining quantitative data against objectives.

Periodical assessment through interviews, questionnaires, focus group discussions, and case studies helps collate the qualitative changes in risk reduction and income enhancement. Regular record maintenance on the users visit at the VKC level, caller's ratio in helpline services enable to understand the significance of growing interest of community towards this interest.

The periodical tracking of the process and progress also help in identifying the existing areas of improvement and rectify the same in finding out appropriate strategies. Mid-term evaluation of the project regulates implementation and its processes and adoption of corrective measures to ensure effectiveness in the reach of services.

**9. Cost to user** (Give details about impact on Service charge paid, travel cost, indirect cost incurred by the user, number of payment channels, etc. #)

The VKC programme is designed as a community centric approach. Comprehending the necessity for embedding sense of ownership among community, the models promoted by MSSRF ensures the same.

Examples, towards the effective functioning of VKCs, the cost sharing are ensured both direct and indirect. They have to bear the cost of venue, electricity bill, maintenance of computers, human resource i.e. knowledge workers and their own VKC Management Committee's meeting expenses. It estimates roughly about Rs.4000 per VKC per month, which comes to Rs. 3, 21, 6000/- per annum for the entire 67 VKCs.

Helpline is not a toll free number and when fishers and farmers call the number for clarifying their doubts, they spend their money for the same. Similarly other interactive platforms such as phone in and audio conferencing. The total users benefitted through these services are 1.35 lakh and spend an average time of about 5 to 15 min for each call. Despite the cost vary depending upon the service provider, the total cost incurrend by the users come to the min of user incur min. of Rs.27000/- to max of Rs.135000/- per annum

The travel cost is estimated roughly about Rs. 30/- per visit to cluster, which happen twice in a quarter. The amount incurred by the user comes to Rs.32,400,000/- per annum.

Counting the aforementioned user cost, the calculation estimates the indirect user cost comes to 243 per user per annum, Rs.20 per month and 06 pase per day for the entire gamut of service being rendered to the farmers and fisher folk. They receive timely, life-saving, risk-reducing, livelihood-enhancing inputs, using the best-fit ICT tools, through the set up a sustainable architecture of community-based information entrepreneurship centre. The feedback indicates the immense value of the services and the interventions through the communities satisfaction and gratitude.

The details described in Q7. Citizen Centricity (Give specific details on the following#) i. Impact on effort, time and cost incurred by user and Q 8 User convenience (Give specific details about the followings #) i. Service delivery channels (Web, email, SMS etc.) highlights the outputs and outcome realized by the fishing and farming community, which is the value that they gained for their investment as cost benefit.

**10. Efficiency Enhancement** (Give specific details about the following #)

**(i) Volume of transactions processed**

The current technology assisted value-added knowledge transaction volume is 140GB per annum.

**(ii) Coping with transaction volume growth**

The current technology assisted value-added knowledge transaction volume is 140GB per annum. The backend has a storage of 10 TB usable capacity capable of coping with exponential growth in transaction volume.

**(iii) Time taken to process transactions**

Knowledge transactions are predominantly processed instantaneously through delivery of locale specific, demand driven content and/or contact with empanelled experts and linkages. In case the transaction requires intervention of external agencies, the turn-around-time is 24 hours.

**(iv) Accuracy of output**

A validation process with experts ensures that the outputs are accurate, authentic and accurate.

**(v) Number of delays in service delivery**

There are infrequent delays in service delivery and bottlenecks are resolved promptly.

**11. Problem Resolution and Query Handling** (Give details about availability of help desk, query resolution mechanism, single window resolution, interactive interface etc. #)

Queries for knowledge and solutions are resolved quickly through a local and dynamic knowledge ecosystem undergirded by a gamut of best-fit, synchronous, and asynchronous ICT tools.

The ecosystem is equipped to develop innovative applications and technological solutions as intelligence and decision making support system for rural communities. The ecosystem also consists of robust partnerships built with multi-stakeholder public and private knowledge providers, empanelment of government key stakeholders, and in house capacity, to tackle queries and resolve the problems of fisherfolk and farmers. The FFMA is a single window solution of the shore-to-shore needs of the fisherfolk that reduces their vulnerability, and empowers them financially.

The agriculture helpline in Tamil, Telugu and Marathi receive together 250 calls a day. The queries predominantly related to the areas of agriculture, horticulture, government schemes, weather, animal husbandry, and education. Season specific, theme based phone in programmes are conducted twice a month, to connect experts with the communities.

The 6 fisheries helplines (Malayalam, Telugu, Tamil) service 1000 calls per month. During disasters, help lines act as an advisory and push vital life-saving forecast information saving the lives of 92 fishermen since inception. Predominant queries in helplines are developed into a theme-based phone in programme to provide detailed information.

**12. Innovation**(Give details on extent to which the service is unique compared to other similar services, impact on number of steps required, identification and removal of bottlenecks/irrelevant steps etc. #)

The community managed and owned VRC-VKC ecosystem is one-of-its-kind process and product innovation in enabling people and communities to participate in and leverage the knowledge economy and empower them to become determinants of their destinies. The intricate ecosystem is replete with enabling factors that foster participation, grassroots leadership, policy advocacy, innovation, linkages between knowledge providers and seekers, convergence of resources, last mile connectivity, capacity building of stakeholders, and community-owned sustainable centres.

The uniqueness of the design and services of the trinity model of ICT action platform is as follows:

The information delivery system is designed in close coordination with key stakeholders including the rural community and strategic partners. The Fisher Friend Programme has both process and product innovation. The whole initiative is an innovative approach as it targets the shore to shore requirements through best fit mobile technology mediated approach. With a decade of deep grassroots experience, community participation processes are integrated with innovative, best-fit mobile technology to dismantle traditional barriers to empowerment such as literacy. The locale specific scientific and early watering information and knowledge services incorporated into the mobile application stand as unique services rendering decision making support system to the fishers and set an example for both product and process innovation.

Example, the FFMA is a one-of-its-kind single window solution to the holistic shore-to-shore needs of the fishing community. It was developed in 2007 by MSSRF in partnership with Qualcomm, and Tata Consultancy Services to run on mobiles with Android platform, in Tamil, Telugu, and English to meet the requirement of the fishing community. It empowers fishers with real time access to crucial information on potential fishing zones PFZ, OSF, disaster alerts, market data, government schemes and entitlements, emergency contact numbers and international maritime border alerts. In agriculture, the plant wise and soil health programmes are shapped based on the constant feedback from the farmers.

The programme necessitated networking and linkages with many institutions / agencies to pool resource persons for expert guidance to fishermen and farmers. The project provided opportunities for farmers and fishermen in directly interacting with the experts and scientific community using digital platform to discuss their livelihood related issues and learning latest technologies. This was very useful in improving the knowledge base and enhancement of improved fishing and farming practices. Strategic partnership with multi stakeholders in public and private sectors not only demonstrates the collaborative and holistic approach, but also instills a sense of ownership among government players.

As the conditions of the sea and needs of fishers and crop pattern and soil texture of farmers are different from region to region, MSSRF adopts cluster approach to customize interventions. The target group is clustered based on agro ecological zones, time of their occupation, type of land holding / asset holding (crafts and gears), so as to deliver the right information at the right time based on their convenience.

- While fisheries interventions are operated through 7 clusters, each cluster consisting of 7-8 coastal districts, the agriculture functions through 4 clusters. Currently, 592 villages from 29 coastal districts across 5 coastal states are covered under this project in fisheries and 578 farming villages in 24 districts of 4 states accessed information and knowledge services related to agriculture.

**The VRC-VKC ecosystem[1]**

The innovation of the community-based ecosystem is that processed and digitized locale-specific, dynamic, demand driven content is delivered in the local language impacting diverse thematic areas of rural life and livelihoods. The VRC-VKCs strengthen the land-land, land-lab linkage, reduce knowledge gaps, and foster social inclusion through integration of ICTs.

[1]Adapted from: https://www.academia.edu/4141329/Nenasala_the_Sri_Lankan_telecentre_experience


Some of the key innovations of the ecosystem are:
The GSM based PA system is an innovative, low-cost, high spread, high impact communication tool that has been reinvented and implemented by MSSRF using mobile technology. It relays life-saving early warnings and livelihood-improving information covering 8400 individuals across 56 locations.

**13. Sustainability** (Give details about Self sustainability of these w.r.t Organization (hiring trained staff, training etc.), financial (Scope for revenue generation, Cost benefit analysis of the project etc. #)

VRC-VKC builds strategic, community-based, ICT-driven architecture with different aspects of sustainability (institutional, financial, social etc.) woven into project design and implementation.

The goal is to spawn information entrepreneurship in the community by designing and implementing a community-centric model of the same, and handing it over to the Panchayat Raj institutions upon exit. Several VKCs are already in dynamic discussion and training their communities and Panchayat Raj institutions in building strategic partnerships as preparation for handover of the VKCs.

Towards this end, the costs towards infrastructure, human resource, and operations of the VKCs are voluntarily borne by the community, ensuring strategic infrastructural sustainability. Cost sharing by community is ensured by right from the inception.

Taking the services forward on a sustainable mode, integration and partnership was inbuilt with multi-stakeholder public and private fisheries partners. These partnerships and the MSSRF impact thereof are replicable by organizations and institutions with deep grassroots experience.

The community-based VKC Management Committee (VMC) comprises of members from different sections of the community. The VMC is equipped in content, capacity building, strategic partnerships etc. so as to be empowered in sustaining the implementation of the VRC-VKC. Several VMCs are already in the process of fund raising towards a corpus fund for sustaining operations. A nominal fee is levied on the community for services such as payment of electricity bills, printouts, internet access for examination results (Rs 15 per student), digital literacy courses (Rs 25-80 and Rs 100- 120), soil and water testing (Rs 20 per sample), common facility centres for sharing of implements.

An example, Since 2004, the Muaguda VKC in Odisha has strived to create a capable ecosystem that can support and sustain the VKC and the farm school. The village development fund has an amount of Rs 100,000 gathered through community's and MSSRF's contributions. The VKC, in November 2013, commenced a sustainability fund currently amounting to Rs 16000, through collecting fees for utilisation of the farm school hall. Operationalising the exit strategy, the village development fund and the sustainability fund will be handed over to the Central Village Committee (CVC), who take will forward the care and management of the VKC and the farm

school.

**Exit strategy:**

VKC Sustainability – Model is inbuilt with community cost sharing. VKC Management committee is trained to identify issues and address through linking with partners.. facilitated by MSSRF. Govt. directly contacting with information services for its reach through VKC

The exit strategy is also operationalised through policy advocacy: INCOIS extends their support to port the data directly to the application. The successful experience of FFMA in Andhra Pradesh and Tamil Nadu drew the attention of the Governments of Andhra Pradesh and Tamil Nadu. The inter and intra disciplinary knowledge consortia comprising of experts from line departments, research and academic institutions, is a sustainable initiative to cater to the knowledge demands of the fishing community.

## 14. Adaptability Analysis

### (i) Measures to ensure adaptability and scalability

Since 1988, MSSRF has assimilated deep grass-roots experience in integrating technology with community development leading to a wealth of learning in overcoming bottlenecks to last-mile connectivity. As a result, MSSRF has a ready package of VRC-VKC implementation strategy which can be replicated within a year, with the same impact.

The model has been replicated by many ICT players when MSSRF initiated the multi stakeholder partnership across the nation through Mission 2007: Every village a Knowledge Centre. The partners from different countries learnt the model and replicated across Chile, Peru, and Srilanka.

The stand alone models of ICTs have been replicated by philanthropic and corporate sectors.

### (ii) Measures to ensure replicability

Replicability is ensured and evidenced through several means:

The seeds sown by MSSRF in the form of commencing a few VRCs grew into a movement called National Alliance for Mission 2007: Every village a Knowledge Centre which was renamed as Grameen Gyan Abhiyan: A Rural Knowledge Movement.

The VRCs commenced by MSSRF preceded and spawned the following architecture of inclusive growth (2012):

- 2.20 Lakh Panchayati Raj Institutions
- Common Service Centres - 88995
- 473 VRCs in the ISRO setup
- 1465 Microsoft Community Technology Learning Centres
- 6500 e-Choupals
- Nenasalas in SriLanka

In the Budget speech by Shri P Chidambaram , Minister of Finance, February 28, 2005 stated: "The National Commission on Farmers has recommended the establishment of Rural Knowledge Centres all over the country using modern information and communication technology (ICT). Mission 2007 is a national initiative launched by an alliance comprising of nearly 80 organizations including civil society organizations. Their goal is to set up a Knowledge Centre in every village by the 60th anniversary of Independence Day. Government supports the goal, and I am glad to announce that Government has decided to join the alliance and route its support through NABARD. I propose to allow NABARD to provide Rs.100 Crore out of RIDF to establish 100,000 Common Service Centres in all the States in India".

The successful experience of FFMA in Andhra Pradesh and Tamil Nadu drew the attention of the Governments of Andhra Pradesh and Tamil Nadu. The Principal Secretary of Andhra Pradesh invited MSSRF for discussion in Hyderabad and plans to take it up for scaling through a centrally sponsored sea safety programme in Andhra Pradesh. The Indian Navy and Ministry of Defence have also called for discussion to incorporate into their existing programmes.

The FFMA won the mBillionth Award South Asia 2014 competing against 300 entries from 9 South Asian countries under the category of m- Agriculture and Ecology, in July 2014, at the India Habitat Centre, Delhi. Jury comments: "It is remarkable to see the continued use of Fisher Friend, an application that supports one of the most vulnerable communities of India that makes its livelihood by venturing the rough sea each day. The application has been taken as a model by other geographies such as Sri Lanka for its worthiness."

An Impact Assessment study by National Council of Applied Economic Research (NCAER) recommended to the government that "IMD could also visualize a Farmers' Friend Programme on a pilot scale along the line of the M S Swaminathan Research Foundation's Fisher Friends Programme to institutionalize the NGO Intermediation process in dissemination of weather information." http://dod.nic.in/ImpactAssessment-MOES.pdf

**Policy Influence:** The successful experience of FFMA in Andhra Pradesh and Tamil Nadu drew the attention of the Governments of Andhra Pradesh and Tamil Nadu. The Principal Secretary of Andhra Pradesh invited MSSRF for discussion in Hyderabad and plans to take it up for scaling through a centrally sponsored sea safety programme in Andhra Pradesh. The Indian Navy and Ministry of Defence have also called for discussion to incorporate into their existing programmes.

**(iii) Restrictions, if any, in replication and or scalability**

There are no restrictions in replication and sustainability

**(iv) Risk Analysis**

The risks associated with the implementation of VRC VKC are:

1) Where there are no Panchayati Raj institutions governing the village, transferring

ownership and implementation of the VRC-VKC to the community becomes a challenge.

2) The intervention faces the ongoing risk of frequent turnover of staff who get equipped in bridging communities' digital divides through their experience in MSSRF and are able to command higher packages going forward.

**15. Privacy & Security Policy** - (Give details about security technique deployed, use of digital signature, encryption etc #)

- Data Encryption Standard (DES) algorithm has been used for the encryption of data exchanged between client and server.
- FFMA centralized database is password protected.
- FFMA Portal is password protected and some of the features are under Admin control only.
- Mobile Application has been configured with Voice based verification for mobile no authentication.

**16. E-inclusion**( Give details about availability of local language interface, Online submission of forms, length and breadth of services made available online, universal accessibility of the application).

The VRC-VKCs are an action platform to enable the communities to interface with the government departments, in online and offline mode. Communities leverage benefits and subsidies by gaining online access to agricultural government schemes and entitlements such as crop insurance, ATMA, National Agricultural Development Programme, water, seed village, micro-irrigation, purchase of implements, horticulture, Kisan credit card, farmers cards, linkages between producers societies and marketing departments of Government. Online submissions of employment renewals, electricity bills, telephone bills and citizenship documents such as community certificate, nativity certificate etc. are also processed at the VRC VKC.

In fisheries, about 2000 fishermen received awareness about boat registration with MPEDA out of which 200 fishermen have registered their boats. 52 fishermen from Nagapattinam have received subsidized GPS equipment from MPEDA. 75 fisherfolk have received tuna long-liners. Under ATMA, 82 fishermen have received subsidized GPS unit. Fishermen are also assisted to receive benefits of children's education schemes.

17. **Result Achieved/ Value Delivered** to the beneficiary of the project-(share the results, matrices, key learning's, feedback and stakeholders statements that show a positive difference is being made etc):

**(i) To organization**

MSSRF has pioneered and evolved a model of telecentre intervention which provides equitable penetration of information and knowledge among households from socially and economically marginalized rural communities, to reduce their risk and vulnerabilities and maximize economic benefit.

**(ii) To citizen**

**Agriculture**

**Risk Reduction and Cost Saving:** Plant clinics function with precision and accuracy similar to human surgeries. After identifying the problem, the Plant Doctors issue prescriptions to the farmers simultaneously detailing the harmful effects of red labelled / banned pesticides, pest resurgence, and pest resistance to pesticides; and the doctors recommend locally available cultural, biological, and chemical methods to treat the problem. This reduced the cost of spray and saved crops. Timely management of severe infestation of paddy blast is an example in point. Third generation pesticides alone would be effective and efforts were made to mobilize the specific pesticides from nearby town and the blast disease was controlled.

**Optimistic Change in the State of Soil Health:** Salinity, alkalinity, poor organic carbon and nutrient status characterise the soil state in villages of Thiruvaiyaru and Pudukottai. The mobile soil testing laboratory (MSTL) selected problematic soils and convinced the farmers to address the deficit and periodically test their soil samples for major nutrients. The results, over a span of 2 years (2012-2014), showed an increase in organic carbon in the fields, from 0.43 to 1.08, nitrogen from 59.3 to 98.8 kg and potassium, from 66.4 to 142 Kg. The overall results clearly indicated an increase in soil health.

**Timely, precise knowledge saves massive crop**

During the critical stage of pest incidence in Kannalagan's maize crop of 5 acres, in Panaiyur, Thiruvaiyaru, the VRC's recommendations helped him avoid crop loss and harvest 60 tons. The market advisory through the helpline services guided him to procure the highest price, and negotiate labour and transport cost.

**From labourer to job creator**

Chithirai selvi (20) is an agricultural labourer from Nochivadaipatty, Dindigul. The FoCT gave her the opportunity to learn tree climbing practices inspiring her to become a tree climber, breaking the traditional gender role. She earned Rs. 8000 in 2 months, formed a women coconut-climbing group with 3 women, and is expanding in a contract mode.

**Fisheries**

Knowledge empowerment of rural fisher folk is achieved through ICT action platform resulting in reduced vulnerabilities in occupational practice, poverty alleviation through increased catches, and increased capacities in participation in resource management. Fisherfolk benefit in the areas of risk reduction, quality control, marine conservation, value addition, and capacity building in new technologies, and leveraging partnerships with the Indian National Centre for Ocean Information Services (INCOIS), Qualcomm's Wireless Reach, National Fisheries Development Board, Indian Coast Guard, Marine Products Export Development Authority, State fisheries departments, Coastal Marine police, Central Marine Fisheries Research Institute and NABARD.

**Transformation of fishers from bottom trawling to pelagic fishing:** Gilakaladindi is a coastal fishing village in Krishna district, Andhra Pradesh, where the fisher folk have changed their

practice from bottom trawling to pelagic fishing using gillnets due to the information services. By using PFZ advisory, the fishers were able to catch a minimum of 500 kg of tuna in one haul. After meeting the expenses, a trawling boat owner gets around Rs 7500-10000 whereas the gillnet owner earns Rs 15000-20000 from a single fishing trip. For bottom trawling, the major expense is diesel requiring 1000 litres per trip whereas gillnetting requires only 400 litres. Due to increased harvest of fish resources of good market potential, there has been a rise in the wages of the fishing crew of the boat as well. Spouses of the fishing labourers and drivers engaged in gillnetting are happy that their men get leisure time while at sea and are also able to spend time with their families now. The women expressed that the health of their men is much better now than when they were engaged in bottom trawling.

**Increased Fish Catch and Income:** A State level Stakeholder workshop conducted in Chennai on 28February 2014 captured the benefits of PFZ and OSF using FFMA. Fishers expressed that their tuna catch had increased from 4 tons to 15 tons per trip, valued at Rs 25 lakhs in the PFZ locations; they were saving on diesel cost and the time at sea had come down from 10-15 days to 4-5 days. This has resulted in the intangible benefit of spending more time with the family due to quick return from fishing.

**Balamurugan rides the waves of life**

24 year old Balamurugan belongs to the village of Saamadhanpettai. He has 4 older brothers, 1 younger brother, and a mother. When he was 14 years old, he was forced to drop out of school and becme a fisherman to support his large family.

Balamurugan now owns a trawler boat and a 10 HP boat, and supports his family through the sole livelihood of fishing. He works hard to afford education for his brothers: One of them is a qualified mechanical engineer from EGSB College, Nagapatinam, who works in Singapore as a project manager. Balamurugan's younger brother is studying to be a civil engineer.

**Before MSSRF's intervention**

Balamurugan lost a family member to the tsunami, and shares that he and his mother tremble at the sight of the sea. But he and his older brothers are forced to venture out day in and day out, fighting the fear of death, as it is a question his family's survival. "My younger brother has never been at sea. I have protected him. The fragrance of the ocean must die with me", he says emphatically, in grief.

**After MSSRF's intervention**

He has been receiving Ocean State Forecasts for 4 years, and Potential Fishing Zone (PFZ) Information for a month. He acknowledges gratefully that the OSF predictions relieve them immensely of their fears, and they are confident of returning home alive. He is very appreciative that OSF and PFZ together, have resulted in safety and consistent income for his family.

The PFZ forecasts have helped him increase his catching efficiency, reduce searching time, and fuel consumption. Earliier, he loitered at sea for 10 days expending 1000 litres of diesel for one

haul. With the accurate PFZ information, he spends only 5 days and 500 litres of diesel, resulting in efficiency, saving time, energy, and resources.

His significant catch-sizes on utilizing the PFZ information are

| S.no. | Date | Fish | Quantity | Price (INR) |
|---|---|---|---|---|
| 1 | 27.12.13 | Seerfish | 1 tonne | 240,000 |
| 2 | 05.01.14 | Seerfish | 0.5 tonne | 180,000 |
| 3 | 17.01.14 | Tuna | 5 tonne | 360,000 |

Out of the profit earned from the above catches, Balamurugan covered the running costs of his livelihood for the following month, paid his brother's college fees, spent on home improvement, and repaid in part to loan-for-gold company, where he had pledged his mother's jewels as collateral to pay for his brother's education.

He is very appreciative that OSF and PFZ together, have resulted in safety and consistent income for his family.

**Nityanantham values the FFMA**

Nityanantham (40) hails from a traditional fishing family in Kasimedu. He owns a double engine fibre boat and employs five hired labourers and two boat drivers. The potential of FFMA motivated him to purchase a new android phone at a price of Rs 10,000 and he got the FFMA application installed. Based on the PFZ information, he caught two tonnes of tuna fish worth Rs. 1, 50,000, with excellent diesel efficiency. He finds this information very useful as it is in the written format and he accesses it even at sea. He values his investment in the mobile device as the FFMA enables him to earn higher income with greater fishing efficiency, eliminating mental and physical stress.

**Matharaju is surprised by bulk catches**

Matharaju (46) owns 5 trawler boats in Kakinada. In February 2014, he and his crew, on a two-day fishing trip, cast the net twice in a PFZ. In total, they caught about two tonnes of fishes fetching a sum of Rs. 150,000, with minimum expenditure of time and fuel. The bulk catches helped them repay debts and compensate during ban period. Matharaju is excited and grateful for the FFMA.

**(iii) Other stakeholders**

MSSRF VRC-VKCs have spawned a new breed of knowledge-empowered communities, through its knowledge-brokering role of entering into synergistic partnerships with technology and knowledge partners.

The ecosystem calls for the co-ordination of multiple players: ICT4D stakeholders, government, private sector, NGOs, and the communities.

As a result, Knowledge and technology providers gain an opportunity to translate their knowledge

into action through partnerships with MSSRF. MSSRF's grassroots expertise and core competency in integrating technology with community affords these providers strategic and tactical advantages in community interface and exerting a sustainable impact among communities.

**18. Extent to which the Objective of the Project is fulfilled-(benefit to the target audience i.e.G2G, G2C, G2B, G2E or any other, size and category of population/stakeholder benefited etc)**

The performance objectives of the VRC-VKCs and extent of impact among communities are as follows:

- To provide demand driven knowledge to small and marginal farm households to improve agricultural practices and minimize risks.

**Impact of knowledge empowerment in Agriculture April 2013 – March 2014**

| Key interventions | Male | Female | Total |
|---|---|---|---|
| Helpline | 999 | 659 | 1658 |
| Audio advisories | 3083 | 1116 | 4199 |
| Audio conferences | 1183 | 754 | 1937 |
| Phone in programmes | 1094 | 652 | 1746 |
| Trainings | 10877 | 8403 | 19280 |
| Video conferences | 442 | 478 | 920 |
| Plant clinics | 2603 | 458 | 3061 |
| Soil and water test | 1187 | 307 | 1494 |
| **Total** | **21468** | **12827** | **34295** |

**Timely, precise knowledge saves massive crops**

During the critical stage of pest incidence in Kannalagan's maize crop of 5 acres, in Panaiyur, Thiruvaiyaru, the VRC's recommendations helped him avoid crop loss and harvest 60 tons. The market advisory through the helpline services guided him to procure the highest price, and negotiate labour and transport cost.

Govindarajan of Villiyanur village, Thanjavur owns 7 acres of wetland and the main crop is paddy. The village is prone for blast disease during samba season and incurs a yield loss of 30-40%. Considering this endemic problem, the VKC organized an awareness program on symptoms, mode of spread, preventive and control measures for blast disease. The community learnt integrated disease management strategies and Govindarajan followed the plant health recommendations. This saved his crop from the blast disease and he got an additional yield of 300 kg per acre.

- To provide necessary knowledge among small craft fisher community for reducing the risks, increasing their fishing efficiency, and fish quality management.

**Impact of knowledge empowerment in Fisheries April 2013 – March 2014**

| Key interventions | Male | Female | Total |
|---|---|---|---|
| Audio advisories | 9416 | 108 | 9524 |
| Audio conferences | 23 | 20 | 43 |

| | | | |
|---|---|---|---|
| Helpline | 7211 | 0 | 7211 |
| Phone in programmes | 762 | 113 | 875 |
| Trainings | 16961 | 1992 | 18953 |
| Video conferences | 33 | 26 | 59 |
| **Total** | **34406** | **2259** | **36665** |

A State level Stakeholder workshop (2014) captured the benefits of PFZ and OSF (FFMA). Fishers expressed that their tuna catch had increased from 4 tons to 15 tons per trip, valued at Rs 25 lakhs in the PFZ locations; they were saving on diesel cost and the time at sea had come down from 10-15 days to 4-5 days. This has resulted in the intangible benefit of spending more time with the family due to quick return from fishing.

**Sivasankaran leverages tuna forecasts**

Sivasankaran is a trawler fisherman from Samathanpettai fishing village. On January 20th 2014, he acted on the PFZ information received through the FFMA at Global Positioning System (GPS) point 11 45 28 15 721E. He caught 3 tonnes of blue fin and yellow fin tuna that fetched him Rs. 2, 85,000. He is indeed thrilled to receive information on tuna forecasts.

**19. Comparative Analysis of earlier Vs new system with respect to the BPR, Change Management, Outcome/benefit, Change in legal system, rules and regulations**

**Agriculture**

The earlier system of traditional agriculture practices was hindered by lack of real-time information and early warnings, poor access to new technology, high cost of production vis-à-vis depressed yields, unavailability of inputs, soil degradation, and water scarcity crisis. The system of traditional agriculture was characterized by disadvantages of unreliability, less efficiency, and increased input costs.

The new system is characterized by a composite of demand-driven, interactive, ICT-based action platforms which strengthens the land-land, land-lab linkage, reduces knowledge gap, and fosters social inclusion.

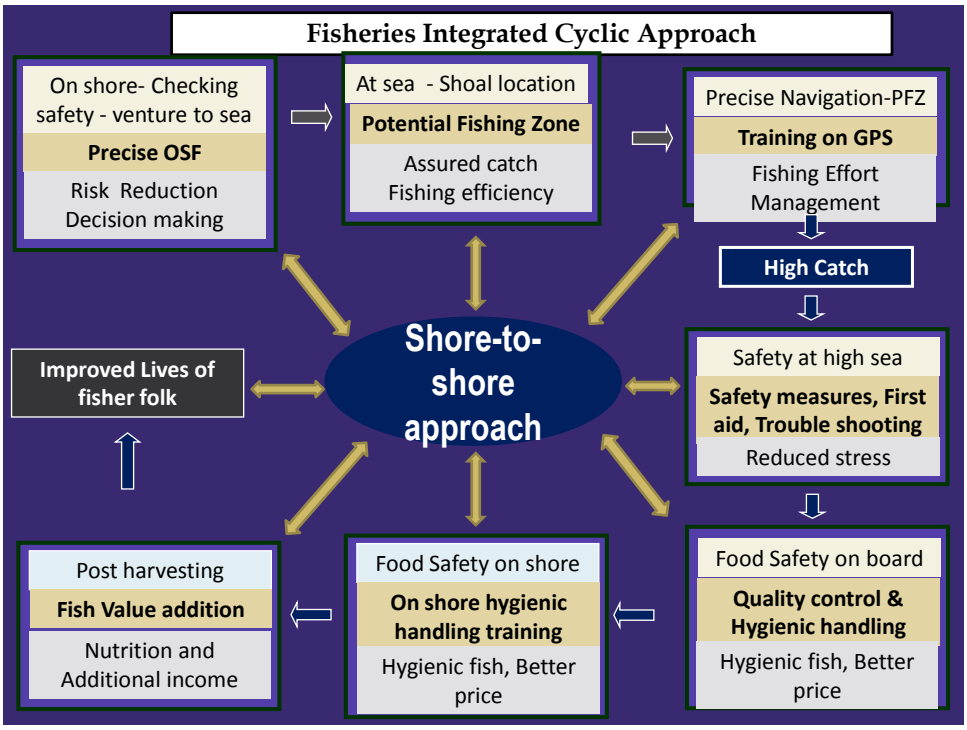
The ICT based package of services meet the knowledge needs of the community through developing and digitising authenticated, locale-specific, dynamic, demand driven content in the local languages. The content impacts diverse thematic areas of rural life and livelihoods such as agriculture, animal husbandry, health, education, disaster preparedness etc. Plant clinics offer expert scientific diagnoses and advisories for specific plant health care concerns. Knowledge on Wheels provides comprehensive soil and water testing services.

**Fisheries**

Traditional fishing methods are ingenious, low-tech systems of gauging movements and seasons of various fish species depending on iridescence, sea colour, etc. However, there are several gaps in the traditional fishing and handling techniques: loss of fishing assets and life due to unpredictable weather and climate change, uncertainty in fish catch due to decline in fish stocks, spoilage of fish due to unhygienic fishing practices, lack of knowledge and skill in new fishing technologies and troubleshooting, crossing maritime boundaries, and unsustainable fishing practices.

With technological evolution, the new system of contemporary modern fishing is characterized by a

shore-to-shore cyclic approach wherein every step of the fisherman's journey from venturing into sea to return to shore is accompanied by the integration of best-fit technology and community processes. This approach results in holistic, community-centric project design and implementation.




The new system has a conglomeration of services affording strong land-lab linkages through which fishermen can integrate their traditional wisdom with the knowledge of the experts. The fishermen access the helpline to gain responses to their clarifications, the audio advisories proactively push notifications of vital information related to fluid maritime realities, the VRC remains physically accessible for fishermen to visit and clarify their queries, and the FFMA is a single window solution to the holistic shore-to-shore needs of the fishing community. Concomitant skill development and capacity building ensures translation of knowledge into action for leveraging the benefits of the ICT-based interventions in agriculture and fisheries.

**20. Other distinctive features/ accomplishments of the project:**

1. **Awards and Recognitions**

- 2014 – mBillionth South Asia Award by Digital Empowerment Foundation to Fisher Friend Mobile Application in recognition of its innovation and timely dissemination of information.
- 2011 – Agriculture based ICT services won runner up from NABARD
- Stockholm Challenge Award 2001 - Category Global Village in recognition of outstanding contribution of VRC-VKC to promote inclusion the use of information and communication

technologies.

- 1999 – Motorola Gold Dispatch Solution Award for VRC-VKC to ensure Reaching the Unreached using innovative use of information and communication technologies.

Recognitions The triumph of plantwise initiatives has drawn the attention of Government of Tamil Nadu for scale up.

1. An Impact Assessment study by National Council of Applied Economic Research (NCAER) recommended to the government that "IMD could also visualize a Farmers' Friend Programme on a pilot scale along the line of the M S Swaminathan Research Foundation's Fisher Friends Programme to institutionalize the NGO Intermediation process in dissemination of weather information." http://dod.nic.in/ImpactAssessment-MOES.pdf
2. FFMA was highlighted as one of the cases in the India Human Development Index 2011 (Page 219) which "saves lives…enhances livelihoods…increases knowledge base by providing updates on government schemes, policies and developments of interest to fishing communities."
3. Fisheries Department Officials from Tamil nadu, Puducherry and Andhra Pradesh have also consulted Helpline and updated their warnings based on the advisories provided.

Appreciating the systemic services of MSSRF in disaster situation, **Dr. Balakrishnan Nair,** INCOIS, said "Not a single fishermen ventured out to sea. Organizations like MSSRF took the pains to disseminate the information to the fishing community along the Tamil Nadu Coast in the DNA press, Jan 5, 2012. http://www.dnaindia.com/print710.php?cid=1633859

4. The Governments of Andhra Pradesh and Tamil Nadu, have shown keen interest in FFMA and are in discussion with MSSRF, for a scale-up.

# This is just an indicative list of indicators, Applicant can add more information based on suitability of the project nominated.