Extension Strategy for Doubling the Income of Farmers – A Successful Experience

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Indian Agriculture today is facing a biggest challenge of making farming a profitable venture than ever before particularly after the globalization and commercialization of agriculture. Though India is proud of having achieved self sufficiency and even surplus in food production including milk, poultry, fish, fruits and vegetables but the question is how to sustain them. According to the recent announcement of Budget for 2018-19 (February 1, 2018) by the Union Finance Ministry, the country's agriculture production was a record achievement of 275 million tonnes of food production as well as 300 million tonnes of fruits and vegetables during 2016-17, which are surplus for the current population leave alone post harvest losses. Surprisingly, the GDP contribution from agriculture was 58 percent during 1950s and today it is going at less than 14 percent. In the process, the agriculture is becoming less profitable enterprise and farmers are disillusioned and losing interest and confidence in farming. Realizing the farmers agony, Hon'ble Prime Minister declared to ensure doubling the income of farmers by 2022.

In the days to come, if no corrective measures are taken for the holistic development of farmers, the numbers of farmers looking for non agriculture vocations are likely to increase and it becomes difficult to hold back the farmers particularly farm youthin farming sectorthus directly affecting food security.

The development of agriculture and allied sectors in the last five decades clearly revealed that the productivity and production has increased significantly but the farmers economy did not improve concurrently. There are many factors which have contributed for the present status, the most important ones are; inadequate and less effective extension strategy, lack of remunerative prices for majority of farm produces, indiscriminate increase in cost of production resulting in very narrow profit margin and sometimes even negative returns, non-availability of labour, over exploitation of natural resources, drying up of public extension system impacting on inadequate and timely dependable information system, non-availability of critical inputs at the easy reach of majority of farmers including custom hire services of farm machinery, weak convergence among various institutions working for farmers, inadequate market infrastructure at the grass root level. More specifically, the farmers' share of consumers payment is around one third across the farm produces. The other factors are: increase in nucleus families, decline in percapita land availability and fragmentation of land holdings. More serious issue in the recent years is increasing social problem than economic problem in rural India particularly not finding good alliance for those engaged in farming besides political factions and land disputes.

The impact is so much that there is indiscriminate migration of Rural Youth in general and Farm Youth in particular to urban areas, in the process many families and villages are becoming old age homes. During 2011, the migration of farm Youth to urban areas in India was at 45 per cent while it was 90 per cent in China. The trend is increasing year after year and no labours are available in some families even to supervise the harvest of perennial produces on the farm, leave alone other farm operations. It is also said that migration is because of growing unemployment problem in rural areas while increasing labour

scarcity for farm operations is a paradoxy.The climate impact in the recent years is further aggravating on all the production functions. Above all the budget allocation over the years both by the centre and state is not matching with cost of production and cost of living of farmers as a result agriculture is becoming less attractive vocation resulting in slow growth of agriculture.

The challenge during pre-green revolution era was to ensure food security by increasing productivity and production but now the need of the hour is sustained food security, profitability, nutritional security and improving the standard of living of the farming families in particular and rural people at large. Therefore more distinct stratagies are required to address emerging challenges in Agriculture today.

There are enough technologies available for doubling the farmers' incomein India, but they are not effectively empowered and supported to enable the farmers to adopt them. Indian agriculture predominantly depends on monsoon and market.

The RBRC project implemented by the UAS, Bangalore was able to address majority of aforesaid issues ofall farmers including landless families.

I. Rural Bio-resource complex (RBRC) project

The Department of Biotechnology launched five RBRC projects across the country;one of the Centers was given to UAS Bangalore during April 2005.

Keeping the present and future challenges, the RBRC project developedholistic approach for bringing sustainable productivity, production, profitability, nutritional security, employment generation, minimizing climate impactand improved standard of living keeping all the aforesaid issues in focus. Initially, two pronged strategy namely; integrated farming system, value addition andprocessing with addressing end to end issues were addressed to fulfill the mandates of the project were undertaken.

II. Structure, location, number of families and duration

The project was headed by Project Coordinator and assisted by Associate Project Coordinator with 32 interdisciplinary senior scientists to identify appropriate proven technology and also to train and guide eight young scientists to work at the grass root level committees were also constituted at the DBT and University level to provide required guidance and support for the effective implementation of the project. The project was implemented involving 8340 families spread over in 75 villages of Tubagere Hobli in Doddaballapur Taluk of Bangalore Rural District located 50 km away from state head quarters (Karnataka in South India) for a period of five years from April 2005 to March 2010 with a budget outlay of Rs. 436 lakhs. Bench mark information was collected from all the 8340 families, analyzed the relevant areas needed for addressing the mandates.

III. Strategy

Initially five point strategy was designed to achieve the mandated objectives namely: appropriate extension strategy, capsule of technologies, providing timely critical inputs and custom hire services, effective functional linkage with related institutions, market empowerment and forming commodity based associations at a later stage of the project.

a) Appropriate Extension Strategies

Due to decline in the presence of public extension system, the rural sector in general and agricultural sector in particular were inadequate both in knowledge and skills required for synthesizing information and technological application required for the farm growth. The success of any technology promoted depends on availability of accurate and timely information addressing end to end issues including marketing which was the major link in all the extension programmes implemented in India since independance. Continuous efforts were made

under this project to empower farm families including landless families with opportunities and new technology. Farmers were constantly empowered by providing relevant information in support of technologies promoted and other related issues.

Empowerment activities organized at two levels. The senior scientists representing different disciplines (32) imparted training to junior scientists covering different disciplines recruited for the project work continuously both on campus and off campus. These senior scientists were also involved in training and organizing exposure visits to local extension personnel, farmers, farm women, farm youth and landless families initially. Thereafter, junior scientists (8) under the guidance of Project Coordinator and Associate Project Coordinator organized a variety of extension educational activities to empower all the stake holders in the project area. The most commonly employed extension educational activities were general meetings, group discussion meetings, agromet advisories, training programmes, field visits, study tours, field days, campaigns, participation in Krishi melas organized in research stations and University campus. Each of these activities was supplemented with relevant printed handouts, leaflets, folders, package of practices, other mass media like Radio, TV, consultation with experienced and awardee farmers.

The most innovative extension activity introduced in the project was use of ISRO Satellite Communication technology. 'Expert Centre' was established at the University main campus and 'Village Knowledge Centre' at the project area. The specialized experienced scientists were deployed to interact in 'Expert Center' at the University Campus on weekly basis. The topic relevant to season, farmers of the area were chosen based on the feedback from junior scientists and local leaders for deliberations at the Expert Centre.

The programme received huge appreciation from all stakeholders. Yet another innovative activity was arranging to display weather forecast information on daily basis by using flash cards at the Milk Producers Cooperative Societies' (MPCSs) near the milk collection centers. The timely communication about weather forecast had tremendous impact on saving harvest and post harvest losses annually by farmers besides certain farm operations.

Sharing the experiences of successful and awardee farmers on various occasions like training programmes, field days and Krishimelas had inspired many contemporary stakeholders. This initiative had much multiplier effect even to distant farmers. These methods had profound impact not only on other farmers of the state, country and even outside the country farmers.

b) Capsule of technologies

Identification and screening of suitable technological packages comprising of different agricultural and allied enterprises were formulated by involving inter-disciplinary team of scientists from the University and the officers of development departments based on benchmark survey report. The technology components mainly comprised Integrated Farming System Modules (IFS), value addition and processing, seed production with emphasis on good agricultural practices, climate resilient agricultural practices with special emphasis on efficient natural resource management. The specific technologies promoted are as follows

- **Field crops**
    - Improved cultivation of Finger Millet (Ragi),Maize,Pigeon Pea, Sunflower, Popcorn
    - Introduction of Sweet corn andBaby corn cultivation
- **Horticultural crops**
    - Improved cultivation practices in Banana,

French Beans, Drumstick and

- Introduction of open field Rose cultivation

Animal based enterprises

- Fish culture, Improved Sheep rearing & Backyard poultry

Natural resource conservation and management

- Soil and moisture conservation, Water use efficiency, Organic farming, Biofertilizers, Biopesticides, Vermicomposting, Apiary, Biofuels & Farm forestry
- **Sericulture and Chawki Rearing Centre**
- **Integrated farming system**
- **Seed/ seedling /graft production activities in all the selected crops and enterprises**
- **Value added products in Finger Millet, Pigeon Pea, Jackfruit and Biofuels**

c) Providing quality critical inputs & custom hire services of farm agricultural machineries

Availability and affordability of critical inputs are major factors having direct bearing on productivity, production and cost of production. Apart from cost of input, quality, easy and timely access will add to minimizing cost of production and increasing profit margin of each farm produce. Effective input management system is essential in bridging the gap in agricultural production. The project aimed at empowering farmers to get access to quality inputs by developing possible and effective input management system as well as providing them timely at the easy reach. Certain critical inputs like seeds, biofertilizers and biopesticides were provided free of cost and distributed through MPCSs. The critical inputs available with other departments and institutions were empowered and ensured timely availability to farmers.

The maximum cost of productionin farming todayis incurred towards labour. Timely availability, cost and quality of labour not only impacts on timely farm operations but also on cost of productivity and profitability of the farm enterprises. Therefore, required farm machinery was made available at the project site for availing them on custom hire basis. Farmers particularly rural youth were trained on use and maintenance of farm machinery by respective manufacturers under the guidance of University Engineers. The facility was very helpful to small and marginal farmers in particular and other farmers in general.When the project was about to be concluded during March 2010, there was a huge demand at least to continue custom hire services.

d) Effective functional linkages with related institutions

Promotion of technology per se cannot help farmers towards economic security unless other backward and forward linkages are adequately addressed. Thus critical gaps in input supply, subsidy, insurance, access to credit, marketing, end user linkage on value addition and processing, access to various other services and resources are crucial to make farming a profitable venture. The project envisaged utilizing the services of other organizations including finance, insurance, development departments, input agencies, marketing organizations, research institutions, local institutions and NGOs functioning in the area. Project worked towards the effective convergence of all the stakeholders for the overall development of all families by organizing continuous meetings and discussions among concerned stakeholders.

e) Market empowerment

The farmers share from the consumers payment across the farm produces revolves around one third. Unfortunately, marketing network continues to be a weak link creating hardship to farming community. Farming enterprises suffer from lack of proper market linkages with consumers, storage facilities and agro-based industries. Several thousands of tons of fruits, vegetables and food grains were lost every year due to lack of such linkages and

infrastructure. Project took all the initiatives to empower the farming community on market related issues through continuous capacity building by knowledge and skill imparting activities. More emphasis was given to value addition, processing grading, packing and branding of agricultural produces for maximum realizationof profit and minimization of wastages. Project provided special attention towards establishing marketing linkages of farm produces to marketing organizations and industries by providing market intelligence. All the marketable farm produces were branded as 'UTHAM' and sold in the market.

All these components were effectively implemented in the first year of the project. It was observed at the end of first year that providing respectable price and marketing facilities to farmers could not be ensured particularly for the small and marginal farmers. A series of debates were held involving all the stakeholders on how to find a lasting solution to the aforesaid issues. After weighing all the available options, it was decided to promote commodity based associations not only to address effective marketing of all the farm produces but also to ensure other backward and forward linkages.

f) Establishment of Commodity Based Associations (CBAs)

In order to achieve mandates, the project team took initiative to promote farmers based associations during second year as means of strengthening backward and forward linkages with a special focus to ensure profitable sale of farm produce with least overhead charges. These associations are built around selected interventions by identifying and actively involving group of farmers/farm women/ farm youth which is proven to be reliable vehicle for sustainable productivity, production, profitability besides social harmony.

The necessity of CBAs have become more important today than ever before in view of increasing nucleus family system, divisionand fragmentation of land holdings, uneconomical size of land holdings, difficulty in availing various support systems, such as inputs at the easy reach, use of improved implements, credit and insurance, poor marketing arrangement, inadequate transport facility, lack of local market for their produce, problems of factions and associated social issues. Profitable marketing of produce of farmers is given top most priority through organized arrangements besides, bringing back shared labour concept and social harmony in rural life. The continuation of the interventions introduced during the post project period greatly depends upon active involvement of stakeholders.

CBAs are platforms where farmers share knowledge and experience on the use of appropriate and affordable technologies aimed at increasing their productivity and production. They help in establishment of strong forward and backward linkages between farmers and service delivery institutions. CBAs enjoy similar status as that of cooperatives in terms of legal / administrative procedures, transparency in financial management, but the autonomy as that of SHGs and they are free from rigidities associated with contract farming as decisions are made by members of CBA independently from time to time.

The following ten associations were formed in a span of two years from 2006 – 2008

- Rural Biofuel Growers Association, Hadonahalli
- Jack Growers Association, Hadonahalli
- Organic Farming Farmers Association, Karnala
- Federation of Women SHGs, Tubagere
- Fish Farmers Association, Tubagere
- Flower Growers Association, Hadonahalli
- Corn Growers Association, Hadonahalli
- Fruits & Vegetables Growers Association, Hadonahalli
- Agro Processing Centre, Melekote
- Chawki Rearing Centre, Gangasandra

These associations were established in strategic

places of the project area. Creation of community/common infrastructural facility for the benefit of small and marginal farmerswas specially given attention. The most innovative aspect of the model is the use of the underutilized Milk Producers Co-operative Societies (MPCSs) in each village as the base for the procurement of the village produces, namely, bio-fuel seeds, fruits and vegetables, vermicompost manure and a range of other produces as well as storage of critical inputs for the timely distribution at the easy access of stakeholders besides providing vital information such as weather forecast, market intelligence, new schemes of the government and so on.

Benefits of CBAs

- Registered bodies under the Registrar of Firms & Societies
- Autonomy, flexibility and transparency in the system
- Marketing of all farm produce profitably
- Strengthens backward and forward linkages
- Promotes division of labour and specialization
- Resources, information and experience sharing including machinery and infrastructure
- Provide equal opportunities for all sections of rural society

IV. Implementation of the project

The project was implemented for the period of five years involving all the stake holders with their active participation by organizing need based and timely appropriate extensional educational activities. Meetings were organised regularly at different levels to debate, discuss problems and arrive at innovative mutually acceptable solutions. Although there use to be many local problems while organising educational activities, distribution of inputs, coordination, important functions and establishing certain infrastructure facilities, they were sorted out amicably by discussing timely with all the concerned stake holders. Change of manpower was a common feature at all levels and it was addressed timely by appropriate orientation. Roles and responsibilities were made known to all the concerned to enable them voluntarily and timely actions for the smooth and effective implementation all through the project period. Enough care was taken right in the planning phase for the continuation of needed activities in the post project period. The sanction of KVK by ICAR and its establishment in the project area is the milestone which is aiding follow up, ensuring needed technical support and continuation of activities initiated. Interestingly, the activities initiated by the project served as cushion to KVK for getting Zonal and National Award during 2013 and 2015, respectively. Establishment of commodity based associations played a vital role in the continuation of interventions in the post project period.

II. The successful experience

The successful experience of RBRC project is narrated as follows:

a. Integrated farming

The most important feature of the project is integrated farming. The greatest advantage is, there will be steady flow of income, minimize risk and cost of production, effective use of family labour, improve soil fertility, nutritional security and environment. The integrated farming was promoted to all farm families keeping in view the resource base, family labour, family interest, market demand and other related factors. Every family including small farmers had derived maximum benefit by practicing integrated farming. Majority of farmers have doubled their income and a few farmers have even tripled their income. Sri. H. Sadananda, a small farmer owning 2 acres 14 guntas of land is an inspiration to many young farmers of SAARC countries. During the benchmark year 2005, overall annual net income was Rs.1.25 lakhs and by 2010, the net income was increased to Rs.8.90 lakhs and during 2017, it was Rs.16.35 lakhs. Many VIPs from India and abroad, large number officials,

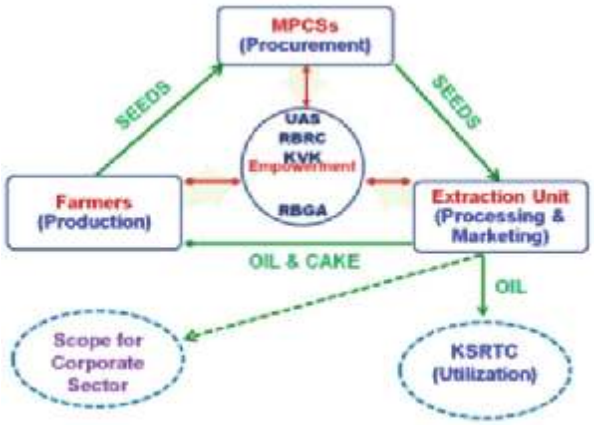
scientists, farmers and students visited his farm and gained valuable knowledge. Many IT & BT professionals have resigned for the job, took up farming after visiting his farm.

b. Rural Biofuel Growers Association (RBGA)

The RBGA was established during 2008 after 42 rounds of meetings, training programmes and exposure visits involving biofuel growers and at present there are 5000 members. A novel initiative is the procurement mechanism established through MPCS at a cost of 5% overhead cost and provided three fold increased price from Rs. 5 to 15 /kg during 2008 and presently Rs. 30/kg. Every family members particularly school going children and old age were actively involved in collection, separation and marketing at MPCSs. The average harvest was 60% before 2008 and it is 100% after the respectable price was ensured at the village level. The required seedlings were ensured at the village level by training the farm youth to raise biofuel seedlings, later on these farm youth have gone for the production of high value Jack and Mango grafts. The unit established is providing employment to five of unemployed and under employed youth in the area besides additional employment opportunity for the biofuel growers. Thereafter, Biofuel Development Board, GOK provided liberal funds for strengtheningthe processing plant by establishing bio-diesel processing unit during 2010-11. Initially, the pongamia oil was used for lighting in temples, festival and individual households. Later on biodiesel was extracted from pongamia raw oil and used at 20 per cent mix with diesel for all types of vehicles. There was a heavy demand for cake particularly from Hi-tech growers paying even advance awaiting two to three months to receive the cake. The model addresses end-to-end solutions for the biofuel enterprise in the area. The association is continued with improved functioning even today under the guidance of local KVK.

Benefits of RBGA

- Availability of biofuel seedlings locally, better use of non-arable dry land,
- Increased area under biofuel plantation, Improves ecology and environment
- Assured price, transparency in weighment and timely payment
- Additional income and employment, reduction of overhead charges
- Availability of quality oil and cake, cent per cent harvest of biofuel seeds



RURAL BIOFUEL GROWERS ASSOCIATION MODEL

c. Jack Growers Association (JGA)

Considering the importance of Jack fruit in the area in terms of assured income, a hardy crop with least expenditure on production, huge demand for fruits in the market and the extent of exploitation by the middlemen, the project staff debated on the start of JGA to ensure respectable price and quality grafts for the growers. During 2006, the income derived from jack fruits was Rs. 5.50 lakhs while during 2010, it was Rs.24.60 lakhs and during 2018 it was Rs.39.50 lakhs. The farmers' share from consumer was 18 per cent during 2007 and it was 68% at present with a fourfold increased income besides a range of other benefits. The model is serving as a centre of education addressing end-to-end issues and efficiently functioning even today with a greater impact across the jack growing belt in the country. The association is continued with improved functioning under the guidance of local KVK.

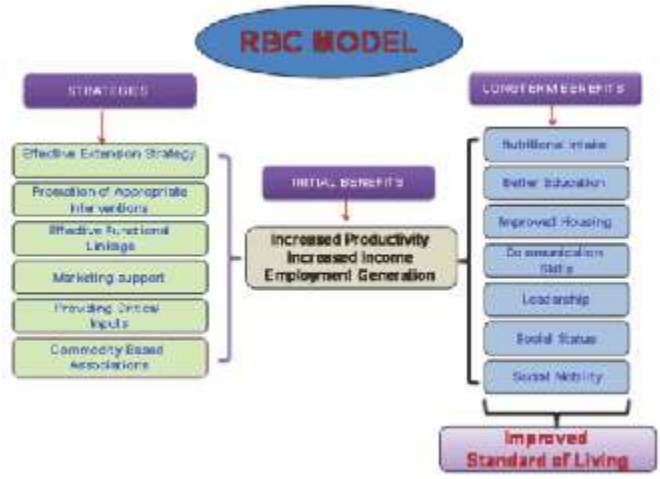
Benefits of JGA

- Large scale production and distribution of jack seedlings

- Scientific harvesting - improved health of the trees since only matured ones were harvested which increased consumer preference
- Registration of elite jack variety with NBPGR
- Assured price - fruit earlier sold at Rs.25 now sold at Rs.100
- Transparency in weighment and timely payment, reduction in overhead costs
- Production and marketing of value added jack products
- Increased income and employment generation
- Gave confidence to establish JGA in other parts of the state and the country.

MODEL OF JACK GROWERS ASSOCIATION

The RBRC Model



During the project period, need based permanent infrastructure facilities were created in the project area with the involvement of different stakeholders for ensuring continuation of activities initiated and sustainable development of the area;

- Establishment of KVK by ICAR, New Delhi, 2007
- VRC and Expert Centre in collaboration with ISRO,2007
- Biofuel Extraction unit,2008
- Automatic Weather Station in the KVK,2008
- Chawki Rearing Centre,2008
- Fish Demonstration Units,2008
- Marketing Complex for Sale of VAPs,2009
- Poultry Demonstration Units,2009
- Two Agro-Processing Units, 2009
- Marketing Complex for the sale of Agri.-Hort. Produce,2011

VIII. Evaluations and research studies conducted

- The evaluation studies were conducted by two external agencies; one being the midterm appraisal during 2007-08 and the other one at the end of project during 2010 keeping the mandates in view. Both the reports have concurred that the project was implemented as per the mandates besides many emerging issues are addressed keeping the farmers in view.
- In between one M.Sc. in Agricultural Economics and three Ph.D. in Agricultural Extension studies were conducted in the project area. The papers from these studies are published in State, National and International journals which have attracted the attention of many academicians, planners and administrators.
- Biofuel network book published by APARI has gone for global circulation and fifth time publication.
- National and International seminars were

organised on jack fruit has attracted the attention of many national and International Scientists on jack fruit.The article published in GLOBAL EARTH has attracted the attention of Global attention on jack fruit.

IX. Significant Contributions From The Nodal Organisations

Corporation bank

- Financial assistance of Rs.40,000/- for the construction of marketing complex
- Instituted two Corp Prasasthi Awards for best farmers in the university.
- Provided a loan of Rs 6,00,000 for establishment of biofuel extraction unit.
- Provided loan to various interventions running to few crores.

Karnataka State Department of Horticulture

- Provided subsidy of 5.00 lakhs for Banana, Mango, Sapota and flower crops
- Provided 50% subsidy for establishment of 22 vermicompost units at a cost of Rs.3,20,000/-
- Sanctioned two projects on Bhendi and Beans seed production during 2008-09 and 2009-10 under NHM with budget outlay of Rs.2.5 lakhs and Rs. 7,98,60, respectively.
- Provided financial assistance to organize National and International workshops on Jack fruit with the financial assistance under NHM.
- Actively involved in HRD activities

Karnataka State Department of Agriculture

- Provided a grant of Rs.4.00 lakhs for the promotion of organic farming
- Provided a subsidy of Rs.56,500/- for the purchase of improved implements for custom hire services.
- Provided subsidy of one lakh for establishment of Biofuel plant.
- Cold storage facility for sweet corn and baby corn
- Market linkage for sale of popcorn

Karnataka State Department of Sericulture

- Provided a sum of Rs.1.00 lakh for the construction of two Chawki Rearing Centres.
- A subsidy of Rs.8,00,000/- for undertaking drip irrigation in newly established mulberry gardens during 2008-09.

Department of Forest

- Rejuvenated the degraded forest land of 2500 ha. around Ghati Sri Subbramanya temple
- Provided seedlings to needy farmers to take up agro forestry

IIHR, Bangalore

- HRD for seed production activities
- Seed and plant materials

Indian Space Research Organization (ISRO)

- Establishment of "Expert Centre" at the University main campus and One "Village Resource Centre" at Hadonahalli

Grama Panchayat, Hadonahalli

- Provided a building free of cost for RBRC office for four years

X. Achievements/Outcomes

The farming community in the project area had realized higher net income from increased productivity from the existing crops, shift from subsistence agriculture to seed production and nursery multiplication, introduction of new crops like open rose, sweet corn, baby corn, increasing the area under mulberry, introduction of tissue culture banana and subsidiary rural enterprises like sheep, fish farming, apiary, vermi-compost, value addition and processing to agricultural based products (VAPs). Further, introduction of integrated farming system demonstrations, improved water use efficiency measures and soil fertility, cultivation of biofuels and agro-forestry in non-arable land, promotion of custom hire services of tractors and

improved agricultural implements, and start of 10 different commodity based associations had cumulative impact on enhancing the income of stakeholders.

The stakeholders showed increased interest in the project due to increase in the farm income and sustenance of the productivity. The project implementation resulted in direct employment generation of 2.52 lakh man days per annum during 2007-08 with sustained increase in subsequent years. An overall assessment indicated that project was able to realize 11 per cent growth rate in agriculture. It was an encouraging outcome, which provided confidence to all the stake holders particularly farmers. The project amply proved that with the promotion of aforesaid interventions coupled with other activities it was possible to sustain the growth of agriculture and rural economy.

The RBRC model in a span of five years of its implementation provided direct benefits to the stakeholders through sustained agricultural growth and income. In addition to direct benefits many indirect benefits accrued; improved soil fertility, soil moisture conservation, decrease in cost of production, reduction in overhead charges, improved environmental conditions, decline in migration especially farm youth, enhanced food and nutritional security, improved leadership qualities and higher confidence among farmers particularly farm youth and women. All the RBRC beneficiaries were satisfied about the benefits derived from the project. The coverage in mass media, opportunity to share their experiences in various media and public events had improved their confidence level. Further, the recognitions and awards for achievements by the farmers, farm women and youth helped them to derive greater satisfaction in their vocations. The project has impacted positively in terms of sustained adoption of technologies, effective functioning of local institutions, farmers to farmers' knowledge sharing even after completion of project. It stands testimony and demonstrates the resilience, sustainability and robustness of the project concept as a pilot model.

XI. Replications/Scaling up

- NBDB has advocated the replication of this model in North Eastern States during 2008-09.
- Litchi Growers Associations have been established in Bihar on the lines of Commodity Based Associations in 2009.
- Karnataka Government has replicated IFSD approach of RBRC project in all 29 KVKs in Karnataka covering 1.25 lakh farm families from 2011-12 to 2013-14 by providing a budget of Rs.75 crores for a period of three years.
- Governments of Andhra Pradesh and Odisha have approached the University to provide technical expertise to replicate this model in their states.
- Sri Lankan Government has shown keen interest in replicating this model. The Government of Sri Lanka has deputed around 400 SriLankan Bank officers and progressive farmers in 14 batches over a period of 3 years to observe the project activities for replication in their country.
- Established 18 VRC's across the state.

XII. Recognition to farmers/institutions

- Institution of Two CORP PRASASTHI AWARDS sponsored by Corporation Bank, Mangalore by depositing an amount of Rs.3 lakhs in the University. Awards are given every year from the interest amount accrued. Each award carries a cash amount of Rs.10,000/- to be presented in the annual Krishimela at GKVK Campus. These two awards were presented for the first time in the Krishimela 2007 and being continued every year.
- Three awards were also given to best farmers/farm women in the project area during Maize Field Day in October 2007. The prize amount was sponsored by Corporation Bank, Tubagere. Best women achievers were

recognized during important occasions.

- Best Progressive Farm Women District Award presented to Smt. Channamma, Antharahalli village of the project area during the Krishimela 2007 held at UAS, GKVK.
- Best Progressive Farmer District Award presented to Sri H.Sadananda, Thapasihalli village who happens to be an IFSD farmer of the project during the Krishimela 2008 held at UAS, GKVK. He also received HARVEST OF HOPE- A Tribute to the Enduring sprit of Indian farmers conferred by Department of Agricultural Cooperation, New Delhi 2010; Krishi Pandith award – 2010 conferred by Govt. of Karnataka in 2010 and Dr. G.K. Veeresh Award, a prestigious award for practicing best integrated farming practices in South India.
- IARI Best Farmer National Award for the year 2008 was presented to Sri H. Sadananda, Thapasihalli village who happens to be an IFSD farmer of the project during the Krishimela 2008 held at IARI, New Delhi.
- Jamsetji Tata National Virtual Academy (NVA) Fellow-2009 to Smt.Chennamma Antharahalli by Sri. MS Swaminathan Research Foundation Chennai, 2009.
- Swami Sahajananda Sarswathi Extension Scientists Award of the ICAR-2008 was conferred to Dr.K.Narayana Gowda, Project Co-ordinator, RBC on the foundation day of ICAR – 16.07.09. This award was given based on the report submitted about the project work.
- IACR South Zone KVK Award 2013 and ICAR National Award 2015 to the KVK, Bangalore Rural District for outstanding performance SPECIALY mentioning continuation of project activities.

XIII. Important visitors from India/abroad.

The project attracted many distinguished visitors from within and outside the state as well as across 22 countries. The other visitors include Farmers, Students, Officers, Entrepreneurs, Planning Commission Senior Officers, Administrators, Elected Representatives and so on.

The most important visitors were:

Dr. APJ Abdul Kalam, Former President of India.

Dr. V.L.Chopra, Former Member, Planning Commision, GOI.

Dr. S. Ayyappan, Secretary, DARE and DG, ICAR, New Delhi.

Sri. Umesh Katti, Hon'bleMinister of Agriculture, GOK.

Sri. M. Veerappa Moily, Hon'ble Union Minister for Law & Parliamentary Affairs, GoI.

Dr. Hansraj Bharadwaj, His Excellency, The Governorof Karnataka.

Sri. H D Deve Gowda, Hon'ble Former Prime Minister of India.

Sri. Gopala Gowda, Hon'ble Judge, Supreme Court of India.

Sri. Sri. Sri. Nirmalananda Swamiji, Adhichuuchanagiri Mutt, Karnataka.

All these dignitaries appreciated the work carried out in the project area.

XIV. Path breaking activities

Interestingly the project outcome was brought in tremendous impact in many fronts. The most important ones are;

- The Karnataka Government sanctioned Biofuel Park at Hassan Agricultural College with a substantial funding support followed by Biofuel Task Force during 2008. Thereafter Government of Karnataka established Biofuel Development Board during 2010 with a budget outlay of Rupees 80 crores to take up large scale plantation of different biofuel species and to replicate the model of establishing processing plant across the state.
- The custom hire services have been replicated by Government of Karnataka in all the 746 Hoblies of Karnataka.
- DBT sanctioned a project "Value chain in

Jackfruit" with a budget outlay of 4.65 crores during 2012 to implement in five states which made far reaching impact.

- The momentum was given to the start of Farmer Produce Organizations at the state level in case of coconut, sericulture, sheep, jack fruit, mango and banana.
- Large scale processing plant in Jackfruit is encouraged during 2013 by inviting prospective entrepreneurs across jack growing states. The first jack processing plant is commissioned in Kerala during 2015; three are in the pipeline in Karnataka.
- Recently, the Governments of Kerala and Meghalaya have declared Jackfruit as their state fruit.

XV. Follow up measures and most innovative activities

Sanction of KVK by ICAR andits establishment in the project area, thereafter start of ten commodity based associationstogether have taken up follow up work.

Most innovative activities

Project was able to come out with many innovative activities and the most significant ones are:

- Use of MPCS for the sale / distribution of critical inputs and procurement of certain farm produces.
- Establishment of Expert Centre at the GKVK campus and village Resource Centre at the project site was helpful toreach junior scientists and farmers effectively by Senior Scientists.
- Start of CBAs which inspired to start few more by the farmers themselves and also in many places across the country.
- Farmer's share of profit in case of Biofuel was 78 per cent and 67 per cent in case of Jackfruit which was 24 and 18 per cent, respectively.

XVI. Policy issues

1. Ensuring sustainable food security.
2. Increasing Farmers share of consumer's payments.
3. Improve the standard of living of farmers.

In order to ensure aforesaid outcome, national policy on promoting Rural Bio Resource Model (RBRC) across the country is absolutely essential with increased budgetary provisions for promoting IFSD, providing effective information support system, ensuring timely critical inputs and custom hire services of farm machinery, effective functional linkages, providing timely market intelligence, promoting CBA'S, establishing need based infrastructures for value addition and processing, threshing, storage facilities and marketing facilities.

XVII. Speacial features of the project

Extension programmes over the period have failed to ensure all-round and sustainable development of rural families. The present model was able to overcome all the past limitations and was able to bring in all-round development of all the families in the project area. The most important once are listed below.

1. Holistic development of all families.
2. Addressing end to end issues including marketing and value addition and processing.
3. Enlisting active participations of all stake holders.
4. Institutions linkages to ensure follow up.
5. Food and nutrition security.
6. More than double the income of all farm families.
7. Additional employment generation to the tune of 2.52 lakhs man days
8. Migration was at minimum.
9. There was no farmer's suicide reported.
10. Replication was taken up on large scale.
11. The total budget allocation was 436 lakhs- Comes to around Rs. 5000 per family for a period of 5 years.

XVIII. Recommendations

1. The RBRC model may be initiated across the country in view of its helpfulness in doubling the income of farmers by 2022 as envisaged by the Government of India.
2. The project on extension strategy implemented through UAS, Bangalore has proved that it can facilitate increased food production and productivity, cut down the cost of production and thus substantially increases the income of farmers in a short span of time; that is within the targeted five years.
3. Budgetary provision can be made for the purpose, with the supplemental bill by the Government of India at the earliest.
4. Ministry of Agriculture and Farmers Welfare, with the support of ICAR, can explore an extension system to handle the project of this magnitude.
5. The Krishi Vignana Kendras (KVKs) operating across the nation may be made nodal organizations to implement this model with the organizational and technical support of Agricultural Universities and other relation organizations.
6. Since there is lot of scope for farmers' participation through the programme execution, they will earn better and live better.
7. The SAARC countries may take up this RBRC project on a pilot basis to know about its feasibility and utility in the prevailing conditions in the respective countries.

CONCLUSION

At a time when the country is struggling hard to achieve two per cent growth rate in agriculture, this model has demonstrated 11 per cent growth rate besides threefold increase in added net income, increased employment particularly among younger generation. The variety of CBAs and other activities promoted in the project area are being continued even today by the respective stakeholders mainly because follow up mechanism established due to effective linkages with respective institutions. Therefore the model could be replicated across the country as well as other Asian countries with suitable refinement to suit different agro-climatic zones. The sustainable development goes with mobilizing local people to take the responsibility for continuation of technology realizing best price for the produce as well as undertaking value addition and processing which was effectively addressed through the start of need based commodity based associations.

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