

Guidelines For ‘Support To State Extension Programmes For Extension Reforms’ Scheme, 2010

Background:

Extension Reforms in India were pilot tested in 28 Districts of 7 States under Innovations in Technology Dissemination (ITD) component of World Bank-funded National Agricultural Technology Project (NATP) during the period from November, 1998 to April, 2005. This successful experiment served as a basis to launch the Scheme “Support to State Extension Programmes for Extension Reforms” in its first phase since 2005-06. The Scheme was later up-scaled to 252 districts during the 10th Plan.

The resolution made by the National Development Council (NDC) in the year 2007 highlighted the need for revamping and strengthening the extension system to provide for improving the skill levels of the farming community and harnessing the potential of ICT in villages.

The National Policy for Farmers, 2007 (NPF) envisaged support to State Governments for strengthening the extension machinery through re-training and re-tooling of existing extension personnel. The NPF also stressed on promoting farmer-to-farmer learning by setting-up Farm Schools in the fields of selected farmers, who could lead by example.

On the basis of experience gained during the implementation of the Extension Reforms scheme from 2005 to 2009 and after consulting the State Governments, the Government of India has revised the ongoing Centrally Sponsored Scheme “Support to State Extension Programmes for Extension Reforms” by modifying and strengthening the earlier Scheme. A detailed circular about the revised scheme was issued on 16.04.2010 to enable the State Governments to finalize their Work Plan, well in time.

BROAD FEATURES OF THE SCHEME:

The pre-revised Scheme (which has been modified now with effect from April, 2010) benefited farmers (through extension functionaries) by imparting training and involving them in exposure visits, demonstrations, study tours, exhibitions etc. This entire gamut of extension related activities was broadly termed as ATMA Cafeteria. A

new institutional arrangement in the form of Agriculture Technology Management Agency (ATMA) at the district level was created for coordinating the extension activities. Similarly, the State Training Institutes popularly known as SAMETIs were entrusted with the task of training of extension functionaries at the State level. However, in the absence of dedicated manpower and infrastructure at SAMETI & ATMA level, the extension delivery mechanism could not function efficiently. The focus had been more on implementation of activities rather than systemic reforms viz. bottom up planning, multi-agency extension strategy, gender mainstreaming, coverage of allied sectors and convergence. The formal extension mechanism below the Block level was mainly through Farm Schools. Though Farm Schools have been an effective mode of ensuring farmer-to-farmer extension, their outreach has been limited. Moreover, due weightage to size of the States in terms of number of Blocks was not given in the pre-revised Scheme.

The Revised Scheme provides for dedicated specialist and functionary support to take up training and extension initiatives at State, District and Block level. Besides this, improvement in extension outreach right down to the village level is expected to be achieved through Farmer Friend. Infrastructure and manpower support to SAMETIs will give a boost to the HRD and capacity building of extension functionaries. The cost norms of selected ongoing activities have also been revised and some new need-based activities have been introduced under ATMA Cafeteria, 2010.

OBJECTIVES:

The Revised Scheme shall focus on the following key extension reforms as objectives of the Scheme:

- ❖ Providing innovative, restructured and autonomous institutions at the State /District/ Block level,
- ❖ encouraging multi-agency extension strategies involving Public/ Private Extension Service Providers,
- ❖ ensuring an integrated, broad-based extension delivery mechanism consistent with farming systems approach,
- ❖ adopting group approach to extension in line with the identified needs and requirements of the farmers in the form of CIGs & FIGs,
- ❖ facilitating convergence of programmes in planning, execution and Implementation,

- ❖ addressing gender concerns by mobilizing farm women into groups and providing training to them, and
- ❖ moving towards sustainability of extension services through beneficiary contribution.

The above objectives shall be met through strengthened institutional arrangements, dedicated manpower and revamped strategy as described in the para below.

STRATEGY

The Revised Scheme will be implemented through the institutional mechanism as detailed below:

State Level:

- (i) The State Level Sanctioning Committee (SLSC) set up under Rashtriya Krishi Vikas Yojana (RKVY) is the apex body to approve State Extension Work Plan (SEWP), which will form a part of the State Agriculture Plan (SAP).
- (ii) The SLSC will be supported by the Inter Departmental Working Group (IDWG). IDWG is responsible for day-to-day coordination and management of the Scheme activities within the State.
- (iii) The State Nodal Cell (SNC) consisting of the State Nodal Officer and the State Coordinator (along with supporting staff) will ensure timely receipt of District Agriculture Action Plans (DAAPs), formulation of State Extension Work Plan (SEWP) duly incorporating Farmers' feedback obtained through State Farmers' Advisory Committee (SFAC) and its approval by the SLSC. The SNC will then convey the approval and monitors implementation of these work plans by SAMETIs and ATMAs. The SAMETIs will draw-up and execute an Annual Training Calendar for capacity building of the Extension functionaries in the State. While doing so, the SAMETI will check duplication and overlapping of training content, training schedule as well as trainees.

District Level:

ATMA is an autonomous institution set up at district level to ensure delivery of extension services to farmers. The apex body of ATMA is its Governing Board (GB), which provides overall policy direction. ATMA GB will be assisted by the District ATMA Cell comprising of Project Director (PD), ATMA, Dy. PDs and Staff in the discharge of its functions. **ATMA Management Committee** is the executive body

looking after implementation of the scheme. District Farmers Advisory Committee (DFAC) is a body to provide farmers' feedback for district level planning and implementation. With dedicated staff provided for the ATMA, it will continue to be the district level nodal agency responsible for overall management of agriculture extension system within the district, including preparation of **Strategic Research and Extension Plan (SREP)**. The process flow for formulating Action Plans has been described in para.

Block Level:

At the Block level, two bodies viz. **Block Technology Team (BTT)**- a team comprising officers of agriculture and allied departments within the block) and **Block Farmers Advisory Committee (BFAC)** (a group exclusively consisting of farmers of the block) shall continue to function jointly (with the latter providing farmers' feedback and input). BFACs shall represent Farmer Interest Groups (FIGs) / FOs existing within the block on rotation basis to advise the BTT. **The Block ATMA Cell consisting of these two bodies, Block Technology Manager and Subject Matter Specialists will provide extension support within the Block, through preparation and execution of Block Action Plans (BAPs).**

Village Level:

- (i) **The Farmer Friend (FF) (one for every two villages) will serve as a vital link between extension system and farmers at village level.** The FF will be available in the village to advise on agriculture and allied activities. The FF will mobilize farmers' groups and facilitate dissemination of information to such groups, individual farmers and farm women directly through one to one interaction, individually or in groups and also by accessing information / services on behalf of farmers as per need through Common Service Centres (CSC) / Kisan Call Centres (KCC).
- (ii) Wherever available under their respective Schemes, **Agri-entrepreneurs** will supplement the efforts of extension functionaries by making quality inputs available to the farmers and by providing them critical technical advice.
- (iii) **Farm Schools** will serve as a mechanism for farmer to farmer extension at 3 to 5 focal points in every Block.

The organizational structure at various levels has been depicted in the following diagram:

State Level: Inter-Departmental Working Group (IDWG)

SAMETI Executive Committee
State Farmers Advisory Committee (SFAC)

District Level: ATMA Governing Board

ATMA Management Committee
District Farmers Advisory Committee (DFAC)

Block Level: Block Technology Team (BTT)

Block Farmers Advisory Committee (BFAC)

The revised composition, functions and mandate of these Committees have been given at **Annexures 1(a) to (f)**.

Process Flow for Action Plans: SREP is a comprehensive document identifying research/extension priorities for the district, keeping in mind agro-ecological conditions and existing gaps in technology generation and dissemination in all agriculture and allied sector areas/activities. SREPs will be prepared for new districts in coordination with the line departments, Krishi Vigyan Kendras (KVKs), Panchayati Raj Institutions (PRIs), Private Sector, farmers and other stakeholders at district level.

- **These SREPs shall be revisited after every five years to accommodate newly identified gaps and emerging areas of importance.**
- SREPs will form the basis for formulation of Block Action Plans (BAPs) on an annual basis. Block Action Plans are then consolidated at the District level to prepare the District Agriculture Action Plans (DAAPs).
- **District Plans are worked out in such a manner that these serve as subset of the Comprehensive District Agriculture Plans (CDAPs) prepared for the District under Rashtriya Krishi Vikas Yojana (RKVY).**
- The DAAPs will be consolidated in the form of State Extension Work Plan (SEWP), which then forms a part of State Agriculture Plan (SAP).

Components of the Scheme:

The Revised Scheme has two sub-sets of activities:

(i) Specialist and Functionary Support at various levels which has to be necessarily put in place over the years as per the approved phasing and availability of funds. However, in the case of States which are already having the same/higher numbers of dedicated extension functionaries possessing similar qualifications & experience as approved under the Scheme and detailed at **Annexure-II (a)** and **Annexure III (b)**, the required number of persons will get reduced accordingly. **Specialist and functionary support could be availed at State, District, Block and Village level to an overall extent of 50% during 2010-11, subject to availability of funds with the States.** Within this ceiling of 50%, the States may evolve their own priorities for filling up these posts at various levels. Increasingly higher percentage targets for manpower (out of the total numbers given in the next chapter) will be earmarked for subsequent year(s).

(ii) Cafeteria of Activities

Besides the essential component of dedicated manpower, a Cafeteria of Activities has been prepared and placed at Annexure-II. The States may choose locally suitable activities from the Cafeteria. Keeping in view the availability of funds, the expenditure has to be optimised to support a limited percentage of activities out of the Cafeteria to be performed in a given year. This gives requisite flexibility to the States to prioritize their activities.

Strengthening of Extension Related Manpower:

Strengthening of extension related man power is proposed at three levels viz. State, District and Block level. Roles and responsibilities of extension related manpower provided under this Scheme have been given in Annexure-III (a). A statement showing specialist and functionary support approved for various levels, details of staff/posts at each level, mode of recruitment, proposed emoluments and suggested qualifications is at **Annexure-III (b)**.

State Level:

(i) State Nodal Cell: The State Nodal Cell will consist of State Nodal Officer, State Coordinator and supporting staff. The State Nodal Officer (SNO) shall be designated by the State Government, which will also provide requisite ministerial

support. In order to carry out State level activities, as specified in ATMA cafeteria, and to ensure convergence with various departments at State level and to assist the State Nodal Officer (i.e. Director/Commissioner of Agriculture or equivalent) in overall management of agricultural extension system within the State, one State Coordinator has been approved for each State/Union Territory. The State Coordinator is to be engaged on contract basis under this Scheme. The functions of State Coordinator are given in **Annexure-III (a)**. The State Coordinator will function under the overall supervision of State Nodal Officer.

(ii) **SAMETI:** In order to ensure regular training and skill up-gradation of State and District/Block level extension functionaries and for reaching out to the grass roots level extension functionaries and farmers through field visits, the following manpower is provided for SAMETI in each State. **The Director, SAMETI shall work under the overall guidance of the State Nodal Officer identified under ATMA scheme. However, in cases where the State Nodal Officer is not an officer of equivalent or higher rank than Director, SAMETI, the Director SAMETI may work under the overall guidance of the officer under whom State Nodal Officer is placed.** The Faculty Members (Deputy Directors) of SAMETI shall report to Director SAMETI. The duties of Director SAMETI/Faculty are given in **Annexure-III (a)**.

The overall staff position at State level is given below.

Posts No. of Blocks	State HQ.	SAMETI				Total Staff
	State Coordinator	Director	Dy. Director	Accountant/ Clerk	Computer Programmer	
< 100	1	1	4	1	1	8
100 – 400	1	1	8	1	1	12
> 400	1	1	12	1	1	16

District level: Each ATMA Unit, consisting of the following core staff of five persons, under the overall supervision of PD, ATMA, will be responsible for management of agricultural extension services within the District including holding of regular meetings of ATMA Management Committee (MC) and ATMA Governing Board:

- i) Project Director – 1;
- ii) Deputy Project Directors – 2;
- iii) Accountant-cum-Establishment Clerk – 1;
- iv) Computer Programmer/Operator–1

The Project Director, ATMA, shall report to the Chairman, ATMA GB and the two Deputy PDs would work under the administrative control of PD, ATMA. The duties & responsibilities of PD & Deputy PD are given at **Annexure-III (a)**. The PD, ATMA, shall also function as Chairman of ATMA Management Committee.

Block Level:

(i) One Block Technology Manager (BTM) is being provided under this Scheme in each Block to co-ordinate the ATMA related activities of the BTT and FAC. BTM will work under the overall supervision of the BTT Convener for all ATMA related activities. The BTM will perform the following functions:

- Assist the BTT in preparation and implementation of Block Action Plans;
- Operationalization of Farm Schools (key activity to promote farmer-to-farmer extension);
- Organization of and technical interaction with Farmers' Interest Groups & Commodity Interest Groups (organization of farmers around a particular commodity); and
- Maintain an inventory of all FIGs/FOs within the Block.

Besides this, BTM will also assist the BTT in carrying out functions listed at **Annexure- I (e)**.

(ii) Two Subject Matter Specialists (SMSs) are to be placed in each Block exclusively for delivery of extension services in agriculture and allied sectors as per priority areas for various Blocks. The areas of expertise of these SMSs will be decided based on priorities for various Blocks. These SMSs shall be provided requisite connectivity and mobility to perform the following functions.

- Through the Block level officers of Agriculture and allied departments and Block Technology Manager, these SMSs will provide necessary inputs to Common Service Centres (CSCs) and Kisan Call Centres (KCC).
- With the technical support from the BTM, they are also expected to provide requisite technical and knowledge support to Farm Schools, Farmer Friends, farmers' groups and farmers in general.

The BTM and SMSs at Block Level will be engaged by Project Director (PD), ATMA, on contract basis through a mechanism identified by the States. While the SMSs will remain under the administrative control of BTM, the BTM will work under administrative control of PD, ATMA. However, some States may prefer to link the

BTM & SMSs with PD, ATMA through the Block Development Officer (BDO), if activities of agriculture and allied departments are already being coordinated by the BDO at Block level.

MODE OF RECRUITMENT:

(i) The posts of State Coordinators, BTM & SMS at Block level and Computer Programmer (at State & District Level) are to be filled on contract basis with lump-sum remuneration. **All other posts may be filled by deputation/secondment/appointment/selection from among eligible candidates in the Government Departments/Organizations or the private sector for the scheme period or such other mode as the State Government may deem appropriate.** If the State Government deems appropriate in order to have the functionaries in place quickly, regular vacancies also may be filled on contractual basis, by limiting the total remuneration to the gross emoluments at the minimum of scale, till the time these vacancies are filled using any other mode indicated above. The contractual staff may be preferably engaged through an agency identified by the State in view of the long term ramifications of hiring contractual staff directly. **Even if contractual employees are hired through a placement agency, it must be ensured that employees get at least the emoluments stipulated in these Guidelines by insisting on payment by cheque to them. The service charges for the agency could be met from the operational expenses provided at State, District and Block levels in the ATMA cafeteria.** The States may also follow any other procedure prevalent in the State for hiring contractual staff.

(ii) If the officer entrusted with the responsibility of engaging / appointing is performing his / her duties as an additional charge, he / she should proceed with the selection / appointment process instead of waiting for a regular incumbent to join.

SUPPORT FOR INNOVATIVE ACTIVITY AT VILLAGE LEVEL (FARMER FRIEND):

It is necessary to identify and groom progressive farmers to act as focal points at village level. A progressive farmer identified as Farmer Friend (FF) will be placed @ one FF per two census inhabited villages. The FF will help in activating the much-needed village-based, bottom-up planning process and serve as vital link between extension system and farmers at village level. Farmer Friend will lead by example and is expected to have up-graded skills and would be available in the village to advise on agriculture and allied activities. **The Farmer Friend will be engaged by BTM on a resolution of Gram Panchayat (GP), which will, in turn, consult FIGs working in the Panchayat area.**

(i) FFs will not be paid any cash-compensation but it is proposed to provide them with a special opportunity for up-gradation of skills through trainings, study tours and visits to SAUs/other institutes. An amount of Rs.2000/per Farmer Friend per year is proposed for this purpose, which will be supplemented equally, by State Governments. Hence, a total sum of Rs.4,000/per Farmer Friend per year will be used to meet contingency expenditure which he incurs towards discharge of his/her duties as a Farmer Friend.

(ii) Since male farmers are involved **in varied agricultural activities which may require their frequent movements outside** the village, more women farmers may be involved as 'Farmer Friends'. Women Farmer Friends will also be helpful in reaching out to women farmers/farm women.

REVISED ATMA CAFETERIA:

Some additional/new activities and enhanced unit costs for a few existing items, as indicated in bold and italics, have been included in the Revised Cafeteria of Activities as given at **Annexure-II**. This Revised ATMA Cafeteria has now been termed ***Cafeteria of Activities, 2010 (Annexure-II)***. The Cafeteria provides support for State, District and Block level activities. Support for innovative activities is also provided at all levels.

State Level:

(i) Infrastructure Support: The State level activities include support for upgrading state level training institutions such as SAMETIs as per the scale given below:

- Rs.0.75 crore per SAMETI (for SAMETIs catering to States with less than 100 Blocks)
- Rs.1.00 crore per SAMETI (for SAMETIs catering to States having 100 to 400 blocks);
- Rs.1.25 crore per SAMETI (for SAMETIs catering to States with more than 400 blocks).

This support is provided to meet capital expenses related to civil/electrical works and other necessary infrastructure in the SAMETIs. Since sufficient funds have been provided under operational expenses/vehicle hiring/POL to hire a vehicle on regular/temporary basis and to purchase POL for vehicles already available, the support does not include purchase of any new vehicles by SAMETIs.

(ii) Human Resource Development (HRD): Regular capacity building of SAMETI faculty in thematic areas can be undertaken through apex level institutions such as National Institute of Agricultural Extension Management (MANAGE) in collaboration with ICAR Institutes/State Agricultural Universities (SAUs) including Extension Education Institutes (EEIs) being supported by Department of Agriculture and Cooperation. Capacity building of technical staff of agriculture and other line departments at various levels in States may be organized by SAMETI in collaboration with SAUs and KVKs. In addition, one year PG Diploma in Agriculture Extension Management (PGDAEM) is offered by MANAGE for public extension functionaries of all States, through Distance Education mode, for which support is being provided under the Scheme.

(iii) Other Activities: The Cafeteria also supports organization of Agri-Exhibitions, Regional Fairs, Krishi Expos, Rewards and Incentives, Farmer Awards, and Monitoring and Evaluation of the Scheme at State level.

District / Block Level:

District / Block level activities are further categorized into three groups namely:

- (i) Farmer Oriented Activities;
- (ii) Farm Information Dissemination;
- (iii) Research-Extension-Farmer (R-E-F) linkages

Farmer Oriented Activities include development of SREP, mobilization of farmer groups, training/exposure visit of farmers, arranging demonstrations, all aimed at empowering farmers and improving their participation in technology dissemination process. Under the category **Farm Information Dissemination**, local level agricultural exhibitions, information dissemination through printed materials and development of technology packages in electronic form are covered. **Research-Extension-Farmer (R-E-F)** linkages based activities include organization of Farmer-Scientist Interaction at local level, organization of Field-days and Kisan Goshties and support for local level researchable issues which emanate from SREP.

CAFETERIA GUIDELINES:

Earmarking of Funds: Funds for District level activities will be used in such a manner that on the whole 55% resources are for Farmer Oriented Activities; 10% for Farm Information Dissemination Activities; 7% for R-E-F linkages. Administrative Expenditure including TA/DA, hiring of vehicles and POL and operational expenses at District/Block level shall not exceed 28%. However, this ceiling of 28% does not

include staff salary component (viz. Specialists & Functionary Support), which will be as per actuals in keeping with the norms stipulated in **Annexure-III (b)**. Thus, the States should compute their budgetary requirements for manpower support as per mode of recruitment and likely emoluments. **Any savings in administrative expenses can be diverted to other categories but not vice-versa.**

Unit cost ceilings: The norms, as laid down in these Guidelines, have to be adhered to but in exceptional cases and for reasons to be recorded internally in writing, ATMA Governing Board (GB) may go beyond these ceilings by up to 10% without exceeding overall allocation. All such cases shall have to be reported in next year's Work Plan so that appropriate advisories can be issued. Any deviation of more than 10 % from the prescribed norms/ceilings or any activity not specified in the Cafeteria can be taken up by States only with the prior approval of DAC.

Support for ICT, Connectivity & Mobility: The modified ATMA Cafeteria has enhanced focus on use of Information Communication Technology (ICT). Experts of SAUs/KVKs, BTMs and SMSs at Block will be available on mobile phone to provide information of immediate importance to Farmer Friend, FIGs and Farmers. Alerts on weather, incidence of pest and diseases and other crop related important matters will be sent through mobile network. Basic IT infrastructure has been provided to SAMETI and ATMA under the Scheme during Tenth Plan Period. Some blocks have also been provided equipments under AGRISNET and other schemes. This equipment will be fully utilized for extension related activities. In new SAMETIs/ATMAs, requisite IT and other related equipment can be procured under AGRISNET/RKVY schemes. However, any existing SAMETI/ATMA which has not yet spent funds for purchase of IT equipment already provided to it under the original Scheme, may use the unspent balance on this account for procuring equipments as per the unit costs currently approved under AGRISNET Project. **The faculty members of SAMETI, officers of ATMA, BTMs and SMSs will also be required to be mobile throughout their jurisdiction. They should also be accessible on their cellular phones.** A specific provision to ensure mobility and connectivity of the BTMs and SMSs has been kept in their emoluments.

FARM SCHOOLS:

Farm Schools provide the vital link between the progressive/achiever farmers and others in a village. Such farmers should be selected broadly adhering to transparent methodology of selection enunciated in Chapter 4.1.2. These farmers would normally be the ones who have been accepted by other farmers as achiever farmers for their success in adoption of technologies, yield difference, and income raised in agriculture and other allied sectors. Some important points related to Farm Schools have been listed in **Appendix-I** to the ATMA Cafeteria, 2010. Cost norms for operationalising Farm Schools have been rationalised as given in **Appendix-II**. Ceilings fixed on individual items now shall be adhered to.

FORMATION OF COMMODITY INTEREST GROUPS (CIGs):

- (i) CIGs should be promoted/mobilized for all major commodities (Size 20-25 farmers).
- (ii) FIG/CIG members should meet at least once in a month to discuss activities and future course of action.
- (iii) BTT and BFAC shall monitor functioning of all CIGs on a regular basis.
- (iv) CIGs at village level should be federated at block level and subsequently at district level.
- (v) CIGs should maintain proper register & records (commodity /proceedings/ savings/accounts).

INVOLVEMENT OF AGRI - CLINICS & AGRI-BUSINESS CENTRES (AC&ABC):

- (i) The PD, ATMA, may prepare an inventory of agricultural graduates trained under the scheme of AC&ABC and the list of Agripreneurs established in the district by browsing MANAGE website (www.agriclinics.net).
- (ii) Agripreneurs can be appointed as Volunteer Specialists to support Farmer Friends in taking up various activities in the villages under their control including smooth functioning of Farm Schools and in imparting skill based trainings.

SETTING UP OF COMMUNITY RADIO STATIONS (CRSs)

- Funding to private institutions along with Government and Quasi-government organizations for setting up Community Radio Stations (CRSs) can be considered.
- Community based organizations, Agencies/NGOs registered under Societies Registration Act, 1860 or any other such Act and recognized by the Central Government/State Government and serving in Agriculture and allied areas including SAUs and KVKs are eligible for funding.
- Registration at the time of application should be at least three years old.
- The willing Organizations should have basic infrastructure and facilities in the form of a room of about 400 sq. feet, electricity and necessary manpower to run and operate the CRSs.
- ATMA Management Committee (MC) of the District concerned may select Suitable proposal (s); recommend them to the Nodal Officer/Commissioner of Agriculture of the concerned State for onward transmission to DAC through the competent authority.
- The PD, ATMA, would regularly review the performance of CRSs along with other activities with the BTMs. In addition, ATMA GB would review the performance in detail with regard to content creation, involvement of local community, suitability to local conditions, release/utilization of funds for/by CRS and convergence & synergy with SAU/KVKs.
- Detailed Guidelines for Funding of Community Radio Stations are available at <http://agricoop.nic.in/radiocguidelines.pdf>.

OTHER OPERATIONAL MATTERS:

Extent of coverage: The Revised Scheme shall be implemented in all rural districts of the country except 12 districts of Assam which are presently covered under World Bank assistance. These districts will also be covered when World Bank support ceases.

Selection of beneficiaries:

(i) The Cafeteria of Activities contains some individual beneficiary oriented components as well. Some such activities (including training, demonstrations, farm schools, farmer-scientist interactions & exposure visits) have been culled out from the Cafeteria and summarized in **Annexure-IV**.

(ii) **Transparent and objective selection of beneficiaries is of paramount importance not only to generate confidence of the farmers in the Scheme but also to ensure that benefits of extension services get disseminated to all sections of the Society.** Therefore, selection of beneficiaries should be done in the following manner:

- **Preferably, all Panchayats in a Block should be covered on a rotation basis under various components. The Panchayats to be covered in a year should be decided by the BTT in consultation with the BFAC.** However, in some peculiar cases, commonality of approach under area specific projects/schemes or other administratively pragmatic factors may also be given due consideration for reasons to be recorded in writing and conveyed to ATMA.
- Number of beneficiaries of different categories including SC/ST in shortlisted Panchayats will be decided by the BTT in consultation with BFAC so as to have a balanced coverage.
- At least 50% beneficiaries must be Small and Marginal Farmers and 30% beneficiaries should be women farmers/farm women.
- **Individual beneficiaries of demonstration plots, inter-district & inter-state trainings within a Panchayat area and all farmer group beneficiaries should be selected by the respective Gram Sabhas or Gram Panchayats in consultation with FIGs and FOs working in the area, as the State Government may decide.** However, if for some reasons, the list of beneficiaries is not finalized in the above manner within the stipulated time frame, the BFAC in consultation with BTT (through BTM), FIGs and FOs may select the beneficiaries for various activities under the scheme.
- For rewards and incentives at different levels, beneficiaries may be identified by the States in a transparent manner following the existing procedures, if any, or as the States may deem appropriate.

It should be ensured that no farmer gets double benefits of the same kind from different schemes.

Common Issues related to ATMA Cafeteria 2010 (Annexure II):

- (i) Minimum 10% of Beneficiary Contribution should be ensured for the four activities aggregated at State level, namely – Farmers' Training (B-2); Demonstration (B-3); Exposure Visits (B-4) and Capacity Building of farmers groups (B-5) listed in the Cafeteria. **However, the beneficiary contribution in respect of SC, ST, Women beneficiaries as well as for beneficiaries belonging to North Eastern and Hilly States would be 5 percent.**
- (ii) Minimum 30% of resources meant for programmes and activities are required to be allocated to women farmers and women extension functionaries. Specific documentation of expenditure and performance for women may be kept.
- (iii) No expenditure shall be incurred from extension work plan allocation on in-eligible items. In the event of any such expenditure, the in-eligible expenses shall be deducted from the State's allocation, next year.
- (iv) Operational Expenses in Serial No. A.8 (b) under State Level Activities, Serial No. B.14 of District and Block level Activities and Serial No. D.1 of Innovative Activities include technical assistance, consultancies, special studies, workshops, library, internet, telephone and other contingencies including accommodation for BTT-FAC meetings. The cost for hiring of vehicles, POL and expenses on FAC meetings, if any, could also be booked under operational cost at Block level (B.14).
- (v) Any sub-detailing not specified under ATMA Cafeteria, such as for Demonstrations, Trainings and Exposure Visits, would be as approved under an appropriate scheme of the Central/State Govt. Otherwise, prior approval would have to be obtained from IDWG.
- (vi) **Unless otherwise specified under some compelling circumstances, or in case of States, which are not eligible for RKVY funding, the SLSC set up in the State for considering proposals for RKVY funding will also consider and approve SEWP and carry out periodic monitoring.** In exceptional cases, the existing procedure for approval of SEWP through IDWG at the State level and Technical Committee of DAC will continue to be followed. The IDWG under the chairmanship of APC/PS (Agriculture) may continue to perform monitoring of the Scheme to ensure that the Extension Reforms are executed as per these Guidelines. The IDWG shall meet at least once in every quarter.

- (vii) Programmatic funds should be spent on rainfed areas at least in proportion to the extent of rainfed areas in the district.
- (viii) The Ceilings under Farm Information Dissemination activities (B 8, 9 &10) have been enhanced to facilitate the State Governments to organize Agriculture and Farmer Development Workshops & Exhibitions. Therefore, the States may give adequate attention to such activities.
- (ix) **Recognition of achievement of progressive farmers acts as an inspiration to other farmers in the area to adopt modern and other appropriate agricultural practices. Such awards also create a healthy competition among farmers to enhance productivity and performance.** ATMA Cafeteria, 2010 (A-7, B-6) has a provision for rewarding the progressive farmers. The States should make use of these provisions not only to reward farmers but also to publish success stories.

CONVERGENCE:

Detailed Guidelines for achieving complementarities in training and capacity building have already been shared with the States vide D.O.letter no. 26(4)/2008-AE dated 04.12.2008.

Convergence of Manpower: With the given manpower support, ATMAs will also look after the work related to RKVY, NFSM, National Project on Soil Health and Fertility Management etc. as mandated under respective schemes. **There should be full convergence of extension related work being carried out under different programmes/schemes. The field level extension workers under these different programmes/schemes should work in conjunction with the dedicated manpower being provided under this Scheme under the umbrella of BTT or ATMA, as the case may be.** While these extension related workers and consultants under other schemes/programmes can continue to act as experts in their respective fields, they should also double up as multi-functional extension workers in the jurisdiction to be assigned to them by the BTT/ATMA. Budget for extension related components in different schemes and programmes of DAC shall be dovetailed at district level through ATMA. **Once all the extension related workers start working in unison, they shall be fully responsible for achieving convergence & synergy in extension related work under RKVY, NFSM, National Project on achieving Soil Health & Fertility to achieve complimentarity and check duplication of efforts and resources.**

Convergence with Research System: The Revised scheme for Extension Reforms provides for active involvement of Research System/Research Agencies at different levels of implementation. State Agricultural Universities (SAUs) and Krishi Vigyan Kendras (KVKs) have to be fully involved not only in preparation of SREP and Extension Work Plans but also in implementation of various programmes in the field. They will be represented in all bodies, namely, ATMA GB and ATMA MC in districts, SLSC/ IDWGs at State level, BTT - BFAC Meetings at Block level and in the Policy Committee at the national level. In addition, each KVK scientist may be made in charge of one or more Blocks within the district. **The KVK Scientist will technically advise the BTT and will also be actively involved in preparation of BAPs, especially with regard to research related issues/gaps and strategies. He will also take feedback for his colleagues in the KVK in respect of their respective areas of expertise.** Detailed Guidelines for achieving effective Research - Extension – Farmer Linkages are given at **Annexure V**.

Convergence with Development Departments: Necessary convergence with all line departments is to be ensured through their involvement in the process of preparation of SREP and Work Plans at Block, District & State levels. Work Plans to be submitted to SLSC for funding under the Scheme should explicitly specify activities to be supported from resources of other schemes and those proposed under ATMA Programme. Moreover, necessary convergence is to be ensured through integration of CDAPs and District Agriculture Action Plans (DAAPs) – all of which will form an integral part of State Agriculture Plan to be approved by State Level Sanctioning Committee (SLSC) under Rashtriya Krishi Vikas Yojana (RKVY). In addition, the Scheme also provides for active involvement of Panchayati Raj Institutions (PRIs) in the selection of beneficiaries for various farmer-oriented activities, including selection of Farmer Friend.

Convergence with and Involvement of Non-Governmental Sector: In order to ensure promotion of multi-agency extension strategies, and to implement scheme activities in Public-Private-Partnership (PPP) mode, **a minimum 10% of scheme allocation on recurring activities at district level is to be incurred through Non-Governmental Sector viz. NGOs, FOs, PRIs, cooperatives, para-extension workers, agri-preneurs, input suppliers, corporate sector etc.** The non-governmental implementing agencies will be eligible for service charge with a ceiling of 10% of the cost of extension activities (but no staff cost) implemented through them.

The Extension Work Plan involving non-governmental agencies may be prepared at the State level and approved by SLSC/IDWG, without having to obtain recommendation of the BTT/FAC and approval of ATMA, GB concerned. After SEWP has been approved by the SLSC, the State level functionaries shall facilitate necessary coordination between the non-governmental partner and ATMA institutions at the district level so that approved activities are implemented expeditiously. Funds to Non-Governmental Sector partner may also be released at the State level, at the discretion of the SLSC/IDWG. Necessary funds for the purpose may also be retained at the State level.

States should select NGOs which have good reputation of State level standing and with high technical capabilities in the area/activity chosen for their involvement to avoid collaboration with frivolous NGOs. The States may enter into an MOU with the non-governmental agency and advise District ATMAs accordingly.

NETWORKING:

State level bodies/officers viz. State Nodal Officer/State Coordinator will ensure networking of all ATMAs so as to foster information sharing (success stories, best practices, research/extension issues, application of innovative technologies & strategies, etc.). All District ATMAs shall establish their own portals to share information regarding their activities/innovations/successes to the outside world. This Portal shall also have links to related websites both at State and National level.

ALLOCATIONS AND SCHEME COST:

Allocation criteria and Centre–State share: Financial allocations to the States will be in proportion to the number of blocks being covered. **The funding support under the Revised Scheme shall continue to be in the ratio of 90:10 (Centre: State) for all components except Farmer Friend where it will be in 50:50 ratio between the Centre and the States.**

State-wise Allocation: Some States have very small districts whereas some other States have very large districts but the size of the Block does not vary much from State to State. **Therefore, funds available under the scheme shall be initially allocated to States in proportion to the number of Blocks in the State.** Actual release of resources to States shall, however, be on the basis of approved work plans, pace of utilization of funds and physical progress.

Incentive to States for Better Performance: The States may prepare a large shelf of projects/activities and submit them to the department at the beginning of financial year. Better performing States will be encouraged to seek higher revised allocations against approved activities in respect of work plans submitted by them. Such allocation, over and above tentative allocation already communicated to states, will depend upon relative progress in implementation and pace of expenditure under revised ATMA scheme amongst various States and overall availability of funds. Additional support will be provided on '*first come first served basis*'. However, it is clarified that expenditure during the year will be restricted by States to funds actually placed at their disposal by the DAC and States should not incur expenditure in excess of funds already available with the States. Any proposal to the DAC in the following financial year for reimbursement of excess expenditure will not be entertained.

RELEASE OF FUNDS:

Funds will be released to implementing agencies well before the commencement of sowing season, normally in two instalments. First instalment would be released on approval of SEWP and furnishing of physical/financial progress report and Provisional UC for the funds released in the previous year. Unspent balance would be adjusted against releases in the subsequent year. The State will be required to submit a written request for funds. Release of second instalment will depend upon furnishing of the following documents:

- (i) Provisional Utilisation Certificate for the previous year
- (ii) Audited Utilization Certificates (AUCs) & Audited Statement of Expenditure (SoE) for the year before last
- (iii) Monthly and Quarterly progress reports for previous month/quarter
- (iv) Annual progress report for the previous year
- (v) Release of corresponding State's share against funds provided by Central Government upto last year.

Formats for (i) and (ii) above are given at **Annexure VI (a) & (b)** respectively.

The States need to follow a definite time frame for fund releases from State level to District level (within a fortnight of receipt of funds from DAC) and from Districts to line departments/other agencies (within 10 days of receipt of money at district level) to ensure expeditious implementation of the Scheme.

MONITORING AND EVALUATION (M&E):

Activities of the scheme shall be monitored and evaluated at periodic intervals through a specific mechanism generated at different levels-Block, District, State & National Level. M&E will be conducted through BFAC and BTT (Block Level) and ATMA GB (District Level). To achieve necessary convergence, SLSC set up in the State to consider and approve C-DAPs under RKVY funding will also consider and approve SEWP and carry out periodic monitoring. The IDWG under the chairmanship of APC/ Principal Secretary (Agriculture) may continue with the day-to-day monitoring to ensure that the Extension Reforms are executed in line with the broad policy framework. Monitoring Committee constituted under Chairmanship of Additional Secretary, DAC, and Policy Committee headed by Secretary (A&C) at National Level will review, monitor and guide implementation of the programme at DAC level.

Monthly and quarterly reports for each district are to be uploaded by the Project Director, ATMA in a web-based interface available at <http://dacnet.nic.in/extensionreforms> by day 5 of the following month. After ensuring that all the districts have entered their data, the SNO will validate this data for the entire State by day 10 of the following month. No paper reports are to be submitted and all data is to be entered electronically only w.e.f. July 1, 2010. Non-adherence to MIS schedule described above will result in no further release of funds to the State. Effective M & E will be ensured through regular field visits of Inter Disciplinary Teams in project areas, reports, interfaces, conferences etc. The scheme also provides for third party M & E from suitable agencies of the State. Third party monitoring of the Scheme has to be got done annually and reports be sent to DAC regularly. DAC will also organize concurrent M&E including impact evaluation as needed as part of its scheme "Extension Support to Central Institutes/DOE". Besides, all activities of the scheme would continue to be reviewed on quarterly basis in meetings held at National Level. Progress of extension work done by SMSs at Block Level, Farm Schools, Demonstration Plots, Trainings, Exposure Visits and Farmers Friends will be closely monitored using ICT infrastructure and by regular monitoring and meetings by BTT at block level, ATMA at district level and SLSC at State level. **A web-based interface will be provided for this purpose shortly.**

Impact Assessment Studies of extension work done by Farm Schools, CIGs & FFs under ATMA shall be got conducted by expert agencies and corrective action shall be taken timely to attain objectives of revitalization of AES.

PRA TECHNIQUES

A. PRA is both an attitude and a methodology. It is one of the tools of surveying that helps outsiders to understand the village systems, dynamics and politics by using various techniques as well as by methods of direct observation and discussion. These methods or techniques often produce interesting and authentic information of the village. Useful insights are also gained. The process of understanding the agro eco system and the social organization can only be successful with the total involvement of the village people and the officials concerned.

The need for PRA

- 1) Sustained change and the need for accurate and timely information
- 2) It advocates that the people themselves are “Solution Agents” for their problems
- 3) It cuts down the “Normal Professional Bias” and anti-poverty basis towards people
- 4) Reduces down the normal time consuming long methods of survey which consumes the much-needed resources and that gives results after a long time. The method is cost effective, accurate and timely.

The Purpose of PRA

- i) To use farmers’ criteria, choices and understand the local environment with clear local priorities.
- ii) To learn farmers’ indigenous technologies
- iii) To achieve for triangulation, using different methods and involving various people to check and re-check the findings
- iv) To develop self-critical analysis and direct contact with local needs and communities.

Before discussing in detail the techniques used in watershed, it would be appropriate to know some of the general guidelines when we conduct PRA in watersheds.

Operational Instructions on Village Interactions:

The following suggestions would be helpful to ensure a conducive environment for participatory learning. The suggestions contain actions required before, during and after the semi-structured interviews.

Before:

- Meet the villagers with an open and frank mind. Tell them who you are and why you have come here
- Build up personal rapport with villagers
- Identify villagers who are willing to share their experience
- Show full interest and enthusiasm
- Always begin the interview by relaxing the tension of the interviewee by asking general questions and setting the climate for discussion
- Select a suitable place for the interview. Sit down with the villagers on the same floor

During:

- Listen carefully
 - Show empathy
 - Be patient
 - Intense and careful observation is most important
 - Try to understand villager's way of reasoning
 - Do not interrupt, suggest or prescribe
 - Be polite, gentle and accommodative
 - Try to adjust with villagers' convenience
 - Do not lecture
 - Respect villagers as human beings
-
- Head nodding during interview either in approval or in disapproval should be avoided as much as possible.

- Try to follow existing social customs of the village, e.g. remove shoes at the doorstep before entering the house, avoid smoking in front of elders, wish the elderly persons with Namaskar (Folded hands). Do not insist too much upon the women members of the family who are reluctant to talk directly or sit in middle of a gathering. They generally participate in discussions through male members sitting in the foreground.
- Participate whole heartedly
- Accept villagers' offer of hospitality e.g. tea, snacks
- There is no point in getting impatient or becoming too much inquisitive when the villagers discuss amongst themselves in their own local language which we may not understand easily. Other villagers who know our language would love to translate it for us
- In villages of eastern India, there is a practice of offering evening prayers with "Pradip" and blowing conch shell by the housewives of Hindu families near a "Tulsi" plant in the courtyard at dusk. Be respectful at that time and discussions may be stopped for a while, if the group work is progressing in the courtyard
- Lead towards sensitive and important issues using open ended questions
- Asking too many questions at a time should be avoided
- Allow time for reflection and organization of the answers to the group
- Take detailed note of the answers and on the process of discussion and information generation
- Quick sketch of subject under study or innovation of the villagers may be drawn
- Individuals trying to dominate the discussion should be prevented carefully. Intervene politely, comeback to the original discussion and provide opportunities to everyone.
- Do not prolong the group interview unnecessarily
- Revolve the discussions around the main issue without blocking spontaneity

- Change of topic should be smooth
- The intervening group should not generally have more than 4 or 5 people. The number of interviewers should not generally exceed the number of interviewees.
- Use kiplings' seven servants: What, When, Where, Which, Who, Why, How to rephrase questions
- Try to find out different villagers for different tasks (interviews)
- During the course of interview the interviewer should not move out without intimating the group formally

After:

- At the end of the interview, all the interviewees must be thanked individually by the members of intervening group for giving time and sharing their experiences.
- Sit down with all the members and record all the information collected and the process of information generation

Public – Private Partnership

Concept

Over the last one and half decades, the globalized market forces and competition from local and international competitors have increasingly compelled the public and private systems to seek strategic cooperation and partnership to compliment their business, social and developmental goals. The public private partnerships for Indian agricultural development, particularly in the post-WTO scenario, can no longer remain a developmental fad and, therefore, recognized a promising approach to achieve agricultural advances for Indian farmers.

The public extension system is undergoing a transition due to financial constraints, inadequate manpower availability, inadequate knowledge base and accountability among the public extension system functionaries. On the contrary, the private extension system has very limited reach in terms of farmers and crops, covering limited geography, services provided on payment basis with inadequate network to reach out to all the farmers.

Under such circumstances, the supplemental efforts with plurality of institutions like Public Extension System, NGOs, Farmers' Organizations, Para Technicians, Agri Business Companies and Corporate Houses, Cooperatives, Input Dealers, Self Help Groups (SHGs) etc. has become a necessity to augment the supply of quality input and services to the farmers serving entire agri value chain. In view of this, Government of India has laid adequate focus on evolving public private partnership for agricultural development while implementing the Agricultural Extension Reforms Agenda as delineated in the National Agriculture Policy.

Partnership Defined

The term public private partnership in the present context is necessarily a collaborative effort between the public and private sectors contributing for one or more functions like planning, resources and activities as required to accomplish a shared goal set out by the partners. The public and private partnership may occur at any one or more stages in the process of extension, production, procurement, processing, marketing etc. depending upon the stated objectives of the partnership.

Defining Agri Value Chain

Any collaborative effort between partners necessarily has to combine all the elements in the agri-value chain as explained in the diagrammatic representation given below;

<p>Input</p> <ul style="list-style-type: none"> • Manpower resource • Financial resource • Infrastructural resource • Skill, knowledge and advisory resource • Time resource • Agricultural input and other service resource 	<p>Partners</p> <ul style="list-style-type: none"> • Govts. (Centre/ State) • NGOs • Corporate Sector • Cooperative Sector • FIGs & FOs, SHGs, FFs, Farmers • Public & Private Financial Institutions, Insurance Companies 	<p>Processes</p> <ul style="list-style-type: none"> • Relationships among various stakeholders in different combinations through formal/informal/written (MOUs, Formats etc.) arrangements • Around one or more defined functions in the agri value chain on the continuum of seed to money • Proportionately sharing the output, which may be in terms of profit or loss, social responsibility, professional and personal satisfaction, fulfillment of corporate and official obligations etc.
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<p style="text-align: center;">Output</p> <ul style="list-style-type: none"> • Necessarily the direct and instant output has to be the monetary benefits to farmers and other partners • The other outputs or its byproducts may be up-gradation of natural resources, economic viability, environmental sustainability and social accountability
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<p style="text-align: center;">Role of Public System</p> <ul style="list-style-type: none"> • The role of public system may range from Facilitator – Stakeholder – Partner in the enterprise • As long as public system participate, contribute or facilitate in the chain of input-partner-processes-output, it may be considered as partnership • To begin with, public system even need not be a shareholder in profit as the intention of the Government is to help farmer realize higher income
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- Even if two corporates come together for any venture through which farmer is benefited with the facilitation of public system, it would still be considered a public private partnership

The various stakeholders in agri value chain can be classified into three major categories viz., public sector, private sector and group of farmers, and their partnership in any enterprise necessarily should result in benefiting farmers. This nature of relationship is exemplified by citing a few cases of partnership in the following table:

S. No.	Nature of relationships	Examples
1.	Public and Public	Andhra Bank has entered into an MOU with the National Collateral Management Services Ltd (NCMSL), promoted by the National Commodity & Derivatives Exchange of India (NCDEX) for providing loans against farm produce
2.	Public and Private	State Bank of India has signed a MOU with Dabur India to finance farmers for cultivation of medicinal and aromatic crops in Uttaranchal under contract farming arrangement. Food Bazar of Pantaloon has entered into an understanding with NAFED for supply of onions to its grocery retail outlets. 34 such outlets are made operational.
3.	Public and Individual / Group of Farmers	Agricultural Technology Management Agency (ATMA), Chittoor, has facilitated the District Poultry Association to reach an understanding for purchase of Maize from the growers. The Poultry Association gave a written agreement to purchase the maize at Minimum support price of Rs.485 per Quintal. The Poultry association also agreed to supply 2 MTs of poultry manure free of cost to the maize growers. To boost up the maize crop, ATMA, Chittoor, has supplied maize seed free of cost to an extent of 400 acres in Kharif, 2002 and for 1000 acres in Rabi, 2002-03, as an incentive. Technical support is also given by the ATMA and Block Technology Team (BTT) Officers for cultivation of maize.
4.	Private and Private	The Morarka Rural Research Foundation in collaboration with Narco Exports, is to bring 37 varieties of organic farm produce from Shekhawati region in Rajasthan to Delhi and the National Capital Region (NCR). Their retail outlet, Food Shoppe in Gurgaon will also stock vegetables, fruit, pulses, cereals, oilseeds, spices and herbs from the Shekhawati's organic farms. To tap the niche market, the Foundation is planning to make the organic produce available at the doorsteps of the consumers on a weekly basis under a 'Box Scheme'.

		Excel Crop Care and Parle Group have come together in Bheraich district of UP where Excel Crop Care under Excel and Me Programme provide input and advisory services to the farmers through Village Agriculture Practice, and Parle finally purchase the produce from these farmers.
5.	Private and Individual/ Group of Farmers	Excel and Me of Excel Crop Care Ltd. launched the concept of FSA integrated crop management and pest management discouraging mindless use of chemicals, combining indigenous and exogenous technological knowledge. 251 villages are covered all over India and the farmers are provided necessary support in terms of timely advice, inputs or services by Village Agriculture Practitioner (VAP) who hails from the local area and trained in participatory training techniques. The services by VAP include conduct of soil health camps, and soil analysis reports are supplied at the door-step of the farmer. The knowledge sharing portal for VAP and others is created to post, share and access the data and knowledge online.

In any given partnership venture, it is quite possible that two or more stakeholders (of the three viz., public, private and group of farmers) may come together in different combinations based upon the interest and need of the partners.

In order to understand the concept of partnership, one needs to make a distinction between the programmes carried out by the Governments (public system) for the benefit of the farmers without any contribution in cash or kind from them. It is basically a supply driven model. Any supply driven model theoretically cannot be conceived as partnership. The partnership necessarily has to meet the parameters on supply-demand continuum. Hence, the Government programmes and projects where group of farmers contribute to avail services may still be viewed as public private partnership.

The cases of Public Private Partnership

Excel – Parle – Farmers – A case of Partnership

Excel Crop Care Limited (ECCL) initiated one such experiment called ‘Excel and Me’ where ‘me’ represent the farmers. ECCL extended its network to the farmers to give services related to farm advisory, inputs and crop agronomy, which has improved the economic and overall living conditions of farmers in the given geographical area of their operations.

Objective

The main objective of the ECCL is to minimize the cost of cultivation of crops, improve production and productivity by providing advisory services and package of practices, thus increasing the income of farmers.

Excel and Me

Excel and Me is a project dedicated to the cause of Indian agriculture, with farmers becoming increasingly discerning and aware of the choices for agro solutions. In a nutshell, Excel and Me promotes a blend of modern technology and traditional farming methods with clarity and a systems approach to agriculture that is both long term and sustainable.

Excel, over the years, had initiated this systems approach wherein Integrated Pest Management (IPM) and Integrated Crop Management (ICM) were consistently promoted and propagated with a simplified practical understanding of these complex solutions. ICM is a comprehensive system of modern farming technique, balancing the economic, production and environment related factors at farm level. As a result of these measures, farmers are able to take advantage of increased productivity and reduced costs. Under this programme Excel has selected 12 states, 25 locations, 20 crops and cover 251 villages in the country.

The programme identifies the location specific problems of the farmers and then work with them by adopting "ICM Plots" where the work starts from correct practices in land management, water management, soil management, pest and disease and post harvest management. This integrated approach has reduced farmer's cost of cultivation and increased the productivity and profitability.

VAP as an organic link

Excel appointed local Agriculture graduate as Village Agriculture Practitioner (VAP) and located them at their village itself to handle the cluster of villages by visiting and providing services to the farmers. The VAP has been trained in Participative Training Techniques (PTT) that covers various aspects like brainstorming sessions, instruction plans and talks, skill transfer and other interactive programs. These ensure that the farmers are totally involved in the discussions and all their problems come forth. Since every farmer is allowed to voice his/her concern and opinions, the entire team gets involved in analyzing and troubleshooting techniques. Critical problems are

then discussed with agriculture scientists and optimum solutions are formulated. The VAP then helps farmers implement the solutions in their farms in a better way.

During training sessions, even the VAP get to learn newer ideas from the farmers such as traditional knowledge about farming, indigenous pest management techniques like use of neem, mixed cropping, ridge farming techniques, increasing the efficiency of pesticides and fungicides by mixing them with detergents etc. Each VAP hails from the region he/she operates in and therefore his/her knowledge base of the local farming, culture and the crops is certainly high. For instance, the VAPs working in north India have excellent command on the cultivation and protection of crops like Paddy, Cotton, Tomato, Chilli, Potato, Wheat, Mustard, and Pea.

Gyan Kendra

Gyan Kendra, is the place where farmers come and meet the VAP for farm advice and other inputs. The Gyan Kendra is established at a centrally located place of the selected cluster of villages. The center consists of a soil testing laboratory, library, crops photo gallery, a computer that is loaded with information on cultivation practices, diseases and management practices. A computer operator and VAP are available in this center to provide the services. The center provides the following services to the farmers;

- Soil testing facility
- Technique of good quality compost preparation
- Information about ICM/IPM practices
- Information about beneficial insects
- Identification of insects and diseases
- Knowledge about bio-insecticides
- Information about good insecticides/pesticides
- Information about farm inputs and implements like sprayers, nozzles etc.
- Information about grain storage
- Information about control of insects and rodents in grain
- Library facility

Farmers' Data Bank

At Gyan Kendra, a farmers' data bank is developed by collecting the base line information of all the farmers covering in Excel & Me programme. The database gives the complete insight of the area and practices followed by the farmers. The information against the names of farmers, the crops they grow, acreages, method of cultivation, management practices, method of storage of grains etc., is also the part of database.

Excel retail outlet

The Excel & Me not only offers advice to the farmers for crop cultivation but also provides quality inputs at a wholesale price to grow crops for better yields. In view of above, Excel has started a retail outlet at the Gyan Kendra to provide all inputs to the farmers at one place. The farmers who come to the Gyan Kendra receive not only proper advice but also farm machinery on hire. At Gyan Kendra, trained persons in spraying are available on hire basis and they also teach the methods of spraying to farmers.

Role of public institutions

Presently there is no formal arrangement between Excel and other public institutions like KVK and Department of Agriculture. However, informal collaborative efforts are made to provide proper advice to farmers. The KVK scientists are invited by the Excel in the farmers' meet to share the latest research and practices. The scientists of Indian Vegetable Research Institute (IVRI), Varanasi, have provided advice to grow vegetables in Excel and Me villages on the request of ECCL.

Parle-Excel-Farmers at Behraich

Having seen the tremendous response of farmers in Excel & Me programme at Varanasi, Parle joined hands with Excel at Bahraich, and initiated a 'Parle-Excel-Farmer' partnership. Behraich is a backward district of Uttar Pradesh with sugarcane as a major crop in 267 villages in seventy thousand acres. The major drawback of sugarcane farmers is that 96% of them grow rejected varieties of sugarcane with poor farm practices and terribly low yields. These two corporate partners aimed to cover 7000 ha. area under sugarcane production in the year 2004-05 and achieved 15,340 ha in the very first year.

Parle-Excel-farmer programme has resulted in

- Increase in the yield by using improved varieties of sugarcane and package of practices
- Creating awareness about soil health and increase in the organic carbon content in soil
- Creating awareness of using bio-compost and reduction in chemical fertilizer use
- Creating awareness about the application of right inputs in right proportion thus reducing the cost of cultivation

The Parle and Excel venture has fructified in raising the living standards of the farmers. ECCL provided extension service to farmers and Parle provided all the infrastructure facilities required for knowledge transfer. Excel encouraged the farmers to adopt hybrid varieties of sugarcane. Parle has provided 13 acres of land as research farm for conducting trials and demonstration of improved varieties. The ECCL took responsibility of conducting trials and demonstration on various improved varieties on this plot for the farmers. Also some demonstrations were conducted at farmer's fields so that trust building can be done very easily. Parle has established seven Kisan Seva Kendra (KSK) at Parsendi, Kundasan, Badrauli, Marocha, Nandwal, Fakharpur, Bednapur locations within the catchment area of the factory. An Agriculture Development officer (ACDO) is the in-charge for the center operations supported by 1-3 supervisors and an attender. The ACDO and supervisors are graduates in agriculture. Each supervisor is responsible for extension activities in 10 to 20 villages depending on the size of area allotted to the center. The KSK comprises of a training hall, library, soil testing laboratory, and a retail counter where all farm inputs and general grocery items are also sold. The farmers meet the ACDO at the centers to seek advice. Most of the time, the supervisors visit their fields and render advice.

Parle has been working with three sugarcane societies in this region. They are (1) Jarwal society, (2) Government society and (3) Nanpara society. The farmers will register with the concerned society by paying Rs. 221 as membership fee. Once the farmer becomes a member of the society, the farmer's land will be surveyed and hybrid varieties of sugarcane will be supplied to the farmer on cost-to-cost basis. Excel will provide the extension services to the farmers. The services of Excel scientist will be available within 1 hour of call made by the farmer. From time-to-time, the extension persons of KSK visit farmers' fields and provide suitable advice to them. The crop season will be closely monitored by the Parle-Excel and when the

harvesting time comes, the farmer will be given a ticket. The farmer takes his harvested crop to the nearest KSK where weighing machines will be available. The crop is accurately weighed and delivered to the factory. The company deposits the value of the produce in the bank account of the farmer. The transportation charges are also paid to the farmers by the company.

Excel has identified the areas where farmer needs immediate advisory and other help. These are – Termite Management, Use of Improved varieties and conversion of crop biomass. For this, Parle has provided 3 acres of space for accumulation of press mud which can be converted into compost and distributed to the farmers. The best agronomical practices have been followed in this area. Paired-Row-Technique is a method of raising field crop, which provides good microclimate for the proper growth and development of the crop. In this method, proper circulation of air current and penetration of sunlight between the two rows reduces the chances of development of insect-pests and diseases. The company also trains the local rural youth in spraying techniques and quantity of application of such inputs. The farmers also can hire the services of trained persons available at Gyan Kendra for spraying.

Farmers' organizations

Promotion of Farmers' Interest Groups

Everywhere in the world, a limited number of farmers are collaborating with each other in some way or the other – forming groups for sharing of information and working together. Under right circumstances, farmers' groups can make a very positive difference to the lives of those working to improve their livelihood options, as well as to the sustainable development of agriculture.

Groups of farmers, who come together spontaneously or through their own efforts to answer their own felt needs, are more likely to be effective than groups that are brought together to suit the needs of an external agency. The latter category of groups/associations last only as long as the project period. Their cohesion and motivation often lie in material and financial considerations. Spontaneous and voluntary formation of social groups involves a high degree of trust. This is one reason why community groups are often formed around one strong personality, and are formed due to some immediate issue.

There is an important difference between farmers or communities that organize themselves to work together, and farmers being organized in groups by external actors who see this as a vital step and entry point for community development. External agencies often view the creation of organizations as a positive intervention, a way of increasing impact and sustainability of activities. Farmers and communities often benefit from participating in such projects through gaining access to trainings, information, resources and further linkages. However, groups formed in this way are typically more prone to difficulties at the start and there is a risk of their discontinuation if the initiating institution withdraws from the project. Alternatively, where previously established local groups gain the support of external agencies, this arrangement can be very positive. A key challenge for facilitating agencies is to act as catalysts and bring out the self-organising capacities of farmers in the most locally relevant and useful way. However, as groups develop and find their own strength, the external agencies need to consider the different type of support such groups may need.

Types of farmers' organizations

Farmers' organizations can be grouped into two types: one is the community-based and resource-orientated organization; the other is the commodity-based and market-orientated organization.

Community-Based, Resource-Orientated Farmers' Organizations: This type could be a village-level cooperative or association dealing with inputs needed by the members and the resource owners to enhance the productivity of their businesses based on land, water or animals. These organizations are generally small, have well-defined geographical areas, and are predominantly concerned about inputs. However, the client group is highly diversified in terms of crops and commodities.

There are many primary-level agricultural cooperatives in the developing world, but majority of them have been financially vulnerable and ineffective. Strategies have been developed to strengthen these organizations. This group of organizations can generate income from the sale of inputs and outputs. The income can then be put back into the organization by spending it on extension, data generation, business planning, and administration. It is essential to have professional and honest management with constant monitoring and periodic rounds of evaluation (Gupta, 1989).

Commodity-Based, Market-Orientated Farmer Organizations: These organizations specialize in a single commodity, and opt for value-added products, which have expanded markets. They are designated as output-dominated organizations. Not specific to any single community, they can obtain members from regional growers of that commodity who are interested in investing some share capital to acquire the most recent processing technology and professional manpower. These FOs are generally not small and have to operate in a competitive environment. Research, input supply, extension, credit, collection of produce, processing, and marketing are all integrated to maximize the returns on the investments of the members who invested in the collective enterprise. Several successful cases are found in India, such as Grape growers' associations, Onion Growers' associations, Mulkanoor co-operative marketing society, Amul Milk and other Dairy FOs etc.

The rate of success of these organizations is determined by their capacity to arrange for major investments and a continuous flow of raw materials. This requires competent and convincing management of both enterprise-related and member-related aspects. The profits generated are used to provide supplementary and

supportive services at reduced cost to encourage members to use them. To ensure this, high caliber of representative and enlightened leadership is required from among the grower members. It is a challenging and demanding task to conceive, design, build, and nurture this type of FO.

In rural areas, where producers are dispersed and scattered and communications are not optimal, the importance of these organizations is even greater. The village level groups are being provided in-depth capacity building on group dynamics and convergence of developmental programmes through farmers' groups in the initial stages. Experiences have shown that farmers' groups, which are being organized on the pattern of group dynamics and self-help modalities, can provide a sustainable foundation. This may include commodity groups in agriculture, horticulture, livestock etc. at village level, commodity associations, federations of farmers groups at different levels etc.

Stages of group formation:

Broadly there are four stages in organization of groups, as indicated below:

Forming	-	When the group members enroll themselves and conduct 1 to 2 initial meetings
Storming	-	When the group members start discussing and reacting to the various issues / conflicts
Norming	-	When the groups start framing norms to run it successfully
Performing	-	When the group starts performing by lending money and collecting it back, involving in developmental programmes, management of inputs and output marketing etc.

Guidelines for Formation of Farmers' Interest Groups (FIGs)

- Identify existing farmers and commodity interest groups with the help of identified group promoters.
- Identify number of eligible farmers who are now willing to get organized into new group.
- Organize informal meetings with prospective group members to discuss the purpose, methods of operation and benefits of groups, as well as possible enterprises/activities.
- Farmers' groups may be formed on the basis of common needs, common problems, common interest, similarity in commodity, small holders, social

affinity, homogeneity in socio-economic status and neighbourhood etc.

- Encourage rotation of leadership positions among all the group members in order to give all of them leadership experience.
- The optimum number of farmers in a group may be 20-25.
- Each farmers' group may select a convener and a co-convener who shall jointly operate the bank amount.
- Each farmer shall pay Rs. X/- as membership fee.
- Likewise, each farmer shall have a common fund in the group
- Organize farmers' group with the help of locally-available/identified community organizers/group promoter.
- During the initial period of 6-9 months, the members may be encouraged to develop common fund and to take small amount of loan at a reasonable rate of interest as decided by the group. This shall help them in developing a habit of repaying the borrowed amount in installments. This type of modality shall help in developing solidarity in the group.
- Promoting agricultural and allied enterprises and developmental programmes through FIGs.
- Group promoters make a list of potential group members and leaders, possible group activities and required inputs.
- Assess their productive resources, including capital, skills and experience
- Promote agricultural and allied enterprises through FIGs along with market interface.
- Prepare FIGs' annual and seasonal action plans and group promoters may consolidate plans at village level.
- Maintenance of records and registers at groups like resolution books, account books, individual pass books etc.
- Ranking/grading of the above FIGs may be done after 6-9 months. At that stage, only mature FIGs may be given external or project benefit, revolving fund, etc. The remaining FIGs may be further strengthened with the help of group promoter. Later these FIGs may also be given the revolving fund as and when they get maturity. Proper criteria may be used for assessing the maturity of FIGs.

At this stage, special care may be taken not to break any of the existing group, just because of availability of certain financial incentives to FIGs.

The formation of viable and stable groups requires patience and, in most cases, a period of two to six months. Both rapid formation and long delays may dampen the interest of potential group members. The process of group formation may face formidable obstacles. In most of the cases, the rural poor are economically dependent on landowners, traders and middlemen and may fear intimidation if they are involved in independent peasant organizations. Local leaders who may see the groups as a threat to patron-client relationships pose other constraints. Extension functionaries may help to overcome this antagonism by organizing meetings to sensitize leaders to the objectives of the project and, above all, to illustrate the benefits of its activities to the area as a whole.

Group activities

Groups are formed around activities that can meet the identified priority needs and aspirations of those who wish to become members. The purpose of these activities is primarily economic and developmental like increased members' production and income, reduced costs, financial self-reliance and contribution to community welfare. Although group activities vary widely, four general types can be distinguished:

- **Direct income-raising activities:** Groups may intensify production of food or cash crops, develop small-scale animal husbandry, aquaculture or agro-processing, build small-scale irrigation, drainage or anti-erosion systems. Other activities include development of low-cost storage, transport and marketing facilities, supply points for inputs etc.
- **Cost-saving activities.** These include activities that reduce production costs such as bulk purchasing of inputs, group transport and marketing of products, and consumer savings through joint purchasing of consumer goods in bulk. Groups might also benefit from social savings, for example: group agreement in Common Property Resources (CPRs) and social insurance through group welfare funds.
- **Production-facilitating activities.** These include consolidating members' holdings for joint production, cleaning irrigation canals, social fencing and social regulations in CPRs, building or repairing roads, and village electrification. At the political level, groups might lobby for enforcement of land reform laws and others.

- **Community development activities:** Many groups undertake social and cultural activities in the fields of health and sanitation, education and family planning. In many areas, there is an acute need for group action to promote better nutrition, improved food storage, and clean water supplies. Groups are encouraged to undertake social or community improvement activities only at a later stage. It is important that as far as possible each group identifies, plans, carries out and evaluates its own activities. This is essential for group development and eventually self-reliance. While group promoters have an important role in encouraging group activities, especially in the initial stages, facilitating role will be reduced gradually as the groups develop.

Savings and credit

Five basic elements of savings and credit:

- **Savings first:** Groups are encouraged to initiate group-based savings schemes prior to applying for bank loans. Progress in mobilizing group savings provides a measure of members' commitment to the group enterprise and their loan repayment capacity.
- **Group savings and credit:** Delivery of financial services to participatory groups, rather than individuals, carries cost advantages for both banks and the poor. For example, a joint loan application submitted by a group of ten farmers reduces the bank's loan administration costs tenfold; group members need to prepare only one loan application and make a single trip to their local bank branch.
- **Loans based on social collateral:** The cooperating bank is encouraged to relax requirements for physical collateral and use "social collateral" in its place. Members of borrowing groups are held jointly responsible for the repayment of the loan. Should one member of the group fail to repay his or her portion of the loan, the entire group may be barred from obtaining credit until it has been repaid.

Grading of FIGs

Based on the maturity criteria the groups are graded into ABCD categories

Maturity criteria

- Regularity in meeting
- Good attendance (> 80%)
- Good recovery (> 90%)
- Proper maintenance of records and accounts
- Fine for absentees, late comers or those who delay in payment of dues
- Involvement in development of agriculture, allied sector and rural developmental activities.

Once a group fulfills all the above criteria, it is considered to be in matured group - “A” Grade and such matured groups are eligible for involvement in developmental programmes. The B, C & D grade groups need capacity building to become “A” grade group.

Group promoters

The Group Promoter (GP) is a key agent in the success of any participatory project. He or she works with the farmer, building up their confidence in their own abilities and promoting their self-reliance. As this work must be done without creating dependency, the GP’s task is essentially that of an intermediary, with three basic roles:

- Group adviser, strengthening the groups’ leadership, organizational and planning capacity
- Participatory trainer, teaching basic technical, literacy and problem-solving skills to the groups
- “Link person”, facilitating communication between the groups, government, NGOs and other development services.

Experiences show that one group promoter can help to organize an average of 15-20 groups. GPs must have experience in working with people and local organizations in rural areas, and familiarity with the problems of the farmer. It is essential that candidates have a strong commitment to live and work with the farmer. GPs promote self-reliance by involving the group members in activities that allow them to develop leadership and record keeping skills. They encourage group-to-group exchanges, and ensure the presence of one or more group members whenever they deal with supporting institutions such as banks and delivery agencies. It takes three to five years for groups to achieve complete self-reliance.

Once groups have established a sound economic base, then we can promote their consolidation into local-level inter-group federations. These federations promote solidarity and economies of scale both in group activities and delivery of developmental services. Development of local and, eventually, regional and national structures also stimulates formation of more groups. An inter-group federation must be accountable to all group members. It has a facilitating, coordinating and educational role as a source of technical assistance, economies of scale and guidance. For instance, a federation can offer training to FIGs on new technology, credit linkages, storage value addition, marketing of produce etc.

Case study - I- Innovative Farmers' clubs- An overview

The KVK, Babaleshwar, Ahmednagar district in Maharashtra began its initial work through individual contact method and later on through farmer organization like Krishi Vigyan Mandal. The increasing response from the farmers by working through Krishi Vigyan Mandal led the KVK to establish the Innovative Farmers' Club in 1996 with a small volunteer group of 60 farmers, in three villages, which is increased to 144 Farmers' Clubs in 144 villages with 3168 volunteers. The major objective of the programme is to function as an interface between the agri-extension system and farmers for transfer of technology, sharing of market information etc. and to become self-reliant social groups for carrying out developmental activities through their own resources and efforts; and also for developing linkages with credit institutions as well as other development departments.

What are Farmers' Clubs

Farmers' Clubs are grass roots level informal forums. Such Clubs are organised by KVK with the support and financial assistance of NABARD for the mutual benefit of the banks concerned and rural people. The broad functions of Farmers' Clubs are to

- Interface with subject matter specialists of various fields of agriculture and allied sectors, extension personnel of Agricultural Universities, Development Departments and other related agencies for up-gradation of technical know how. For guest lectures, even experienced farmers, who are non-members from the village/neighboring villages, could be invited,
- Coordinate with banks to ensure credit flow among its members and build better bank–borrower relationship,
- Organize minimum one meeting per month and depending upon the need, there could be 2-3 meetings per month. Non-members can also be invited to

- attend the meetings,
- Liaison with Corporate input suppliers to purchase bulk inputs on behalf of members,
- Organize/facilitate joint activities like value addition, processing, collective farm produce marketing, etc., for the benefit of members. They can also form/organize SHGs,
- Undertake socio-economic developmental activities like community works, education, health, environment and natural resource management etc.
- Market rural produce and products

Set Up

Farmers' Club can be promoted in a village/cluster of villages. While Farmers' Club should have a minimum of 10 members, no upper limit in the membership is envisaged. Every Club should have two office bearers - One 'Chief Coordinator' and the other 'Associate Coordinator'. Club Members would elect the office bearers on a democratic basis for a term of two years. The office bearers should be residents of area of operation of the club. No NGO representative can be an office bearer of the club. The chief volunteer, deputy chief volunteer and volunteers can promote 'n' number of farmers into the club depending upon the need; they are called as co-opted farmers for the club. The main functions of the office bearers would be to convene meetings, to arrange meetings with experts, maintenance of Books of Accounts, coordination with Banks and Line Departments of the State Governments, maintaining proper liaison with Bank developmental departments and research institutions.

Membership

All villagers, except willful defaulters, can become members of the club. The club must make endeavour to raise its own resources by way of contribution from members, undertaking certain business services such as bulk procurement of inputs and collective marketing of agricultural produce etc.

Steps followed for Formation of Farmers' Club

- Selection of a village/cluster of villages suitable for launching Clubs
- Organizing General body meeting at village level to explain the need, importance, objectives, structure and advantages of the Farmers' club to the farmers.

- Identification of a few members with good aptitude for development of the club and capacity for teamwork (Success of the Club hinges on the right choice of members).
- Encouraging the members to select a Chief Coordinator and an Associate Coordinator. This will ensure collective leadership and continuance of the Club.
- Providing Orientation training to them with the help of NABARD before launching. Encouraging the members to convene monthly meetings regularly, guiding to have meaningful discussions and to take necessary follow up action.
- Motivating the members to identify credit and non-credit needs (training, socio-economic, village infrastructure, etc.), for preparation of plan of action and accordingly arrange for expert talks, counseling, need-based activities, etc. with the help of Government Departments and other agencies concerned.
- Encouraging the members to maintain Membership Register, Minutes Book and accounts register.
- Evolving of performance parameters and measuring the Clubs' contribution annually.
- Using the Club as a tool in aid of bank branch not only in the matter of credit and recovery but also in facilitating promotion of SHGs, micro credit and convergence of services.
- Encouraging the farmers to take up responsibility. For example, during the second meeting, the farmers themselves identified the members for Farmers' club and prepared a MOU between KVK/NABARD and Farmers' Club.
- Preparation of annual calendar of the club indicating the club activities, area of development and club's involvement, exposure visits, field days, demonstrations, seed village programme etc. in collaboration with KVK.
- Encouraging planning and training activities based on the annual calendar. For example-, the subject matter specialist (SMS), Chief volunteers of Farmers' clubs sit together at apex level i.e. KVK level, and prepare action plan for every 3 months. Eg: In Groundnut cultivation, Chief volunteer collects the information from the willing farmers and prepares an action plan in consultation with the SMS of groundnut. The SMS imparts training to identified 10 farmers those who are the club members or co-opted members of the Farmers' club. The FC organizes field day and the SMS imparts training to the farmers at village level during the field day.
- Encouraging Banking habit and payment of membership fee etc.: The members (Including Co-opted members) have to pay, Rs. 50-100/- as membership fee

and the chief volunteer deposits the amount in the bank in the account of FC - cosignatories are Chief volunteer and deputy chief volunteer. The club retains NABARD maintenance amount and the membership fee.

- Financial support and self-sustainability: NABARD provides financial support for the first three years and for the next two years the facilitated organization may provide the support, if necessary. The club is expected to attain self-sustainability during the period of 3-5 years.

Establishment of the Self Help Modalities with farmers

The Farmers' clubs were seen as intermediaries between the project and the farmers. This vision was started to be questioned as the KVKs and Farmers' clubs began to think that the issues like sustainability and farmer empowerment were losing focus once the project interventions were completed. Actually, the development promotion potential of the Farmers' club on group dynamics had not been sufficiently appreciated.

Experiences have also shown that farmers' groups or associations formed by projects are seldom self-reliant. These associations last for only as long as the project period because they have been established for the completion of a particular task/programme/project. Their cohesion and motivation often lies in financial and material considerations. So, KVK functionaries and Farmers' club members felt that interested members of Farmers' clubs or other farmers from unorganized community can form into Self-reliant groups with SHG norms. Then they started formation of farmer SHGs and presently there are 437 SHGs with 6555 members.

Awareness Programmes were conducted in the village so that the members of FCs get motivated to establish SHG.

The 15-20 member SHG fixed a monthly common fund of Rs. 50/- to Rs.100/- or more as per their decision in the group. Monthly they conduct meeting on a fixed date during which they collect the contribution and also gives loan to the members as per their requirement. In this monthly meeting, KVK gives the technical information as per their demand. Also provides some services and facilities from the KVK. After internal lending for six months, concerned lead banks sanction the loan based on the Maturity criteria for 'A' grade groups. For this purpose, banks evaluate farmer SHG where KVK helps farmer SHG to maintain the records as well as prepare their plan of action.

ICT Initiatives:

Computer to Mobile SMS-Alert Broadcast Service for Farmers

The sources of Information for the farmers have increased manifold in recent times from newspaper, Radio, TV and Internet. With the advent of Internet, information was made available by KVK Babaleshwar for the farmers in villages where the access was given through the village ICT Centres. The information was delivered but would not always substantiate farmers' diverse needs. With the rise in usage of cellular phones by the farmers, there was an urgent need to deliver vital information to serve their diverse demands.

Mechanism

The service started initially with an appeal to all the farmer stakeholders to register their cell numbers along with other crop cultivation details. The KVK later made an assortment of farmers' group based on their crop situation. The grouping of farmers was done to send personalized message according to individual farmer's need during each crop development stage. The commodity wise grouping of farmers was done, e.g. grapes growers, Pomegranate growers, vegetable growers, sugarcane growers etc. The messages comprised weather alerts, market information and technical information to tide over any disease, pest, nutrition or a water management problem. The information is sourced from Internet by the KVK Scientist and interpreted according to the varying needs of the farming community. The short messages are compiled in English letters indicating phonetic meaning in local dialect. The messages are so compiled so as to accommodate only 165 characters compatible for all cellular handsets. Once the message was compiled into an SMS, it was simultaneously broadcasted to all the member farmers within the group having cell phones registered with KVK at a stroke of a single mouse click from computer connected to the Internet. The SMS technically traverses a path from KVK's computer to the Internet server and further to the SMTP Relay server of the BSNL from where it is routed to different GSM operators' network and eventually to each farmer having cell phone. The delivery is instantaneous, reliable, robust and capable of sending single SMS to all registered farmers. Timely advisories on crop protection measures on pomegranate, tomato, brinjal, grapes etc., have also helped the farmers to conduct timely spray and avoid pests and diseases. The potato growers have given a huge response by registering their names for potato contract farming in Rabi season. There are 125 farmers who have booked their area of 214.2 acres for growing potato on contract basis with Frito Lays Ltd., a PEPSI subsidiary working in the field of potato

processing. The programme comprised a huge congregation of 5000 farmers belonging to 324 SHGs and 123 Farmers' Clubs working under the KVK's flagship capacity building programmes.

Major Findings of this study

- Collective purchases and marketing was done by 18 Farmers' clubs on vegetables, flowers, fruits, and their savings is 10-15 per cent in input cost, 20-25 per cent more in market prices. Eg. SRIRAM brand of Fig.
- Membership in Commodity Interest group is on the basis of similarity in commodity and undertaking management and marketing of the particular commodity.
- Export quality production and exporting of pomegranate and grapes in 20 Farmers' clubs
- In the year 2003, some of the members of Farmers' clubs ventured into thrift and credit activity at group level. SHG norms were initiated. Among 20 members, 14 members have shown interest and joined in SHG as homogeneous group. This group saves Rs.100/- per month as thrift amount. Presently there are 437 farmer SHGs with 6555 members.
- Networking through computers and internet and messaging system through cell phones was provided to 30 Farmers' clubs (including villages and hamlets) through IT center
- Capacity building of group in all aspects is the major component for sustainability of Farmers' groups.

50 master trainers were trained by KVK's Subject Matter Specialist on different commodities. Presently they are resource persons for 15 crops like fig, grapes, organic farming, guava, tomato, sugarcane, rose, pomegranate etc. These master trainers are the liaison workers between KVK and the FC on all technical aspects. The mobile number of the master trainers will be given to the FC for contacting the master trainers wherever need arises.

Formation and Management of Federations

When we use the term "federation", we mean an organisation of organizations. A federation can be created for different purposes. It could help to access credit, or help in procurement of inputs, marketing of produce brought in by the members of the FIGs, or, it could engage in policy advocacy. It could also engage in a mix of all these or other developmental activities.

Organizational forms

FIGs can promote several types of federations either registered or unregistered. Registration is necessary if the federation expects to hold properties, financial transactions, and for legal identification. In the case of land, buildings, office equipment and so on, it would be best if these were in the name of the federation, rather than in the name of individuals. For that, the federation needs to have its own identity – as a registered organization.

The four laws providing body corporate status to organizations are:

- a. The Companies Act: For organizations whose aim is to provide a service to the larger community; profit and control are proportionate to the investment made by the owners.
- b. The Trade Union Act: For organizations whose aim is to help workers in a specific industry or work place to improve their working conditions including wages; organizational profit is not the aim; members have equal voting rights.
- c. The Societies Registration Act: For organizations whose aim is to help members scientifically, culturally, politically etc., or to undertake charitable work for the larger public; profit is not the aim but where profit is earned, it cannot be shared by members; members have equal voting rights.
- d. The Cooperatives Act: For organizations whose aim is the social and economic betterment of members through the use of services provided by the cooperative; profit is shared among members in proportion to the use of services by members; responsible and active members have equal voting rights.

As can be seen from the above, if a federation's primary aim is to provide financial and/or marketing services to its members, registering as a cooperative may be the most sensible thing to do.

If the main aim is the social and political empowerment of the people, to do charity and the federation does not undertake any business, then registering under society may be more useful.

Federation of farmers' groups

At the initial stage, major attention need to be paid towards organization of sustainable farmers' groups. After about 1 year or so, the groups can be graded. If more number of groups are in 'A' grade, then the farmers' groups can be federated at different levels namely, village, block, district, state, national and international levels etc. Farmers' groups working at grassroots level have internal group pressure, technology dissemination, and management of inputs, services and infrastructure. Experience shows that in some villages, farmers' groups are also taking the help of Information and Communication Technology to get the information.

Village level federation:

It is appropriate to recognize that undue hurry should not be made in organizing higher-level federations of farmers' groups. It may be better if a step wise approach is adopted in which higher level federations are organized only after the stabilization of lower level federations. The higher level federations may be encouraged to become autonomous bodies through registration under Cooperative societies Act. These federations may sustain themselves through contribution from farmers' groups and village level farmers' organizations against satisfactory delivery of services. If needed, more than one federation may be organized at higher level so that farmers' groups may have flexibility in approaching those, which provide better quality services.

- The village level commodity organizations may be voluntary bodies – no election but nomination of the executive committee by general body. But all members with equal status to act as a pressure group to redress or address the problems of a particular commodity.
- Liaisoning between the farmers' groups and block level federations
- Village level federation (VLF) can develop detailed action plan of village by collecting indents from the farmers' groups on crops grown, needs of the farmers, input requirements, output management strategies etc.
- Based on the detailed action plan, village level federation can procure inputs and distribute the same to the farmer through farmers' groups.
- VLF can manage storage facilities at village level and marketing of produce.

Block and District level federations:

Block level federation may be registered body under mutually aided cooperative registration Act. Two members may be nominated by the commodity groups of each commodity at village level to these block level federations.

Roles and responsibility of federations:

- Liaisoning between the district level and village level federations
- Horizontal net working of federations
- Provide high quality seeds, fertilizers, pesticides and other inputs
- Discuss crop related issues in relation to market perspective, and perceptions based on expert opinion are placed before the village associations.
- Pre-crop, mid-crop, pre-harvest and post-harvest meetings are to be convened by these associations without any restrictions on number of meetings to be conducted by the associations earlier.
- Federation will act as pressure group helping policy-framework
- These federations can work as advisory bodies for the commodity groups
- Gradually, these associations can federate at state and national level
- Flow of market information and market extension
- Provide global marketing information to farmers' groups of society through internet
- Storing, Packaging, grading, marketing and value added produce can be done through the federation
- Developing linkage with all developmental programmes and routed through this federation.
- Provide capacity building for these federations on management of federations, linkage with other institutions, management of forward and backward linkages, market extension etc.
- Organize workshops, prepare detailed action plan of the block level federations etc.
- Engage a Para worker for the major commodity on service charges basis by the farmers' groups
- Provide training to the Commodity groups on seed treatment, crop management practices, technical know how, post-harvest management, grading, packaging, processing, value addition etc.

State and National level federations:

The state and apex level federations can

- Articulate policy advocacy and lobbying.
- Develop institutional mechanism to identify partners for marketing/ processing/exports.
- Build the global competitiveness in post liberalization/WTO regime in quality parameters and cost of production.
- Develop market led extension, marketing of produce etc.
- Focus on credit, crop insurance etc.

Process in formation of Federations

- 1) **Scope:** Federation is envisaged primarily to play the role of a financial intermediary along with other services to the FIGs in forward and backward linkages to the farmers, book keeping, auditing, bank linkages, linkages with developmental programs in agriculture and other line departments etc. The federation is also envisaged to take up social issues and other developmental issues.
- 2) **Federation jurisdiction:** Federation is a network of FIGs in the given village/ block/district/state/nation or any geographical area as decided by the FIGs and facilitated organization.
- 3) **Situation Analysis:** Before starting dialogue on formation of federation with farmers groups, facilitators shall assess if there are any other federations or MACS already existing and functioning in the operational area or at cluster level covering that particular village. If any federation of FIGs exists, the process in formation of federation should be in such a way that the existing federations are not affected.
- 4) **Common understanding at facilitating organizational level:** All the extension staff first need to be given orientation on concept of federation, need, advantages of federation, vision of the federation etc., through training and exposure visits to successful federations.
- 5) **Formation of Federation:** Willingness of the FIG members to come together to form a federation is critical for formation of a federation. The members should be given prior information about the benefits and likely hardships that they may face with the federation such as more meetings, paying user fees etc.

- 6) **Stake of members:** For formation of the federation, each group may be sensitized to contribute one-time share capital. This corpus amount will be helpful for the federation to access bulk loans from the banks and other financial institutes. Further, each group is expected to pay an annual Membership subscription of Rs. X/- to federation to get the services from field functionaries, bookkeeping, auditing, facilitation support etc.
- 7) Identify an appropriate place or building for meeting-cum-federation office.
- 8) **Executive Committee and General Body:** The federation will have a general body with all the FIG Members as members. The federation will have Executive Committee (EC) with one/two/three representatives from each Group/Cluster (If there are less than 10 Groups/Clusters three representatives, 10-20 Groups/Clusters two representatives and if more than 20 Groups /Clusters one representative). The federation will select 5 office bearers viz., President, Secretary, Vice President, Joint Secretary and Treasurer. They will be facilitated to elect the Executive Committee.
- 9) **Federation meetings:** The General Body shall sit at least once in Six months. In the initial phase, the federation may be encouraged to have General Body meeting once in three months. The Executive Committee of Federation shall sit at least once in a month.
- 10) **Setting norms:** Series of facilitations by Community Coordinator should take place in setting up of appropriate objectives and norms for the federation. Norms include role of federation in preparation of action plan for development of agriculture and allied sector, modalities for forward and backward linkages, regular scheduled meetings, participation, decision-making, and mechanism for bookkeeping for FIGs and federation etc.
- 11) **Registration under appropriate act:** After this process, the Federations will be facilitated to register under appropriate act. A registration workshop at Federation level may be organized. A request may be made from Federation to Joint Registrar, Cooperative department, to attend this workshop so that the registration of Federations will take place on the second day of workshop. Sufficient homework shall take place to do this registration at block level. Before registration, federation will be facilitated to understand and develop appropriate bye-laws.
- 12) **Bank Account and withdrawal:** While filing for registration, the Federation should be facilitated to open a Bank Account in the name of federation. Two or three office bearers among President, Secretary and Treasurer will sign the cheques to draw the money from federation account. The federation Executive

- Committee will make resolution for every financial transaction. The federation will write cheque only after resolution from Executive Committee.
- 13) **Group Promoters:** Each Federation may have a group of three or four group promoters to take care of FIGs. One of these book-keepers will also write the books of accounts for federation for which federation will pay appropriate honorarium to the book keeper.
 - 14) **MoU between facilitating organization and Federation:** Promoting organization and Federation would have common understanding on the roles and responsibilities of each of the partners in strengthening the federation.
 - 15) **Role of external agency in the initial years:** Every meeting of federation, whether EC or General Body, the facilitator will compulsorily attend and extend necessary facilitation support. The facilitator will share the collected information from FIGs/clusters and submit to federation for decision-making. The facilitator will take responsibility to ensure that regular monthly meetings, EC meetings and General Body meetings of Federation are held.
 - 16) **Capacity building:** The members of the Executive Committee should be given training in leadership, federation concept, federation management, financial management, linkages, input and output management etc.
 - 17) **Networking:** The federation will be encouraged to deal with local banks/apex institutions and line departments to access further services and linkages. The facilitator shall take all appropriate steps to encourage federations to participate in the appropriate district/state level forums so that effective networking takes place.
 - 18) **Interface with other Federations:** The Federation will be facilitated and capacities should be built to develop and maintain good relations with other federations for sharing and learning.
 - 19) **Bank linkage:** Now the NABARD has developed guidelines for banks to finance the Federations. Consequently, the facilitating organizations should take a proactive role to link the Federations with banks.
 - 20) **Preparation of Annual Action Plan:** Federation can prepare detailed annual action plan with FIGs on input requirements, marketing of farm produce etc.
 - 21) **Procurement of Inputs:** Based on the requirement of the group, bulk procurement of inputs may be made directly from the wholesaler/company.
 - 22) **Marketing of produce:** Federation can maintain storage facilities. After value addition, marketing of produce etc., can be done through federation.

Gender Mainstreaming in Agriculture

What is Gender-Mainstreaming?

Gender Mainstreaming is a process rather than a goal. Efforts to integrate gender into existing institutions of the mainstream have little value for their own sake. We mainstream gender concerns to achieve gender equality and improve the relevance of development agendas. Such an approach shows that the costs of women's marginalization and gender inequalities are born by all.

Gender mainstreaming is “the process of assessing the implications for women and men of any planned action, including legislation, policies or programmes, in all areas and at all levels. It is a strategy for making women's as well as men's concerns and experiences an integral dimension of the design, implementation, monitoring and evaluation of policies and programmes in all political, economic and societal spheres so that women and men benefit equally and inequality is not perpetuated. The ultimate goal is to achieve gender equality”

Gender and Agricultural Development

Agriculture involves both self-employment and wage-employment and accordingly requires precise information about who does what? In fact, the land holding of 75% of farming community being small, the number of landless labourers has swelled up over time by working on others' farm. The situation thus demands an understanding of activity performance of men and women; and the children – girls and boys, whose lives are fundamentally structured in different ways. Their living pattern, work pattern, interaction style and sharing of scientific information differ within the socio-economic groups. Similarly, a gender-based division of labour is universal but culture and community diversities cause differentiation.

Gender, therefore, has to be recognized as the social characteristic that cuts across caste, class, occupation, age and ethnicity. It is gender that differentiates the roles, responsibilities, resources, constraints and opportunities of women and men in agriculture for which precise gender information is the need of the day.

Building gender into agricultural development will lead to:

- Building inherent strength of women and men to mutually learn and share.
- Overcoming gender distorted prejudices.
- Articulating gender perspectives in development activities.
- Involving action from women to men and from men to women for gender sensitization.

Gender Concepts

Sex

Identifies the biological differences between men and women, such as women can give birth, and men provide sperm. Sex roles are universal.

Gender Bias

The tendency to make decisions or take actions based on gender.

Gender Mainstreaming

Gender mainstreaming is the process of ensuring that women and men have equal access and control over resources, development benefits and decision-making, at all stages of the development process and projects, programmes and policy.

Gender-sensitivity

Gender sensitivity encompasses the ability to acknowledge and highlight existing gender differences, issues and inequalities and incorporates these into strategies and actions.

Gender equality

Gender equality is the result of the absence of discrimination on the basis of a person's sex in opportunities and the allocation of resources or benefits or in access to services

Gender equity

Gender equity entails the provision of fairness and justice in the distribution of benefits and responsibilities between women and men. The concept recognises that women and men have different needs and power and that these differences should be identified and addressed in a manner that rectifies the imbalances between the sexes.

OR

Condition in which women and men participate as equals, have equal access to resources, and equal opportunities to exercise control.

Gender issues

Specific consequences of the inequality of women and men.

Empowerment

The process of generating and building capacities to exercise control over one's life.

Gender division of labour

The roles, responsibilities, and activities assigned to women and men based on gender.

Sex disaggregated data

For a gender analysis, all data should be separated by sex in order to allow differential impacts on men and women to be measured.

Gender Planning

Gender Planning refers to the process of planning developmental programmes and projects that are gender sensitive and which take into account the impact of differing gender roles and gender needs of women and men in the target community or sector. It involves the selection of appropriate approaches to address not only women and men's practical needs, but which also identifies entry points for challenging unequal relations (i.e. strategic needs) and to enhance the gender-responsiveness of policy dialogue.

Gender Roles

Gender roles are learned behaviours in a given society/community, or other special group, that condition which activities, tasks and responsibilities are perceived as male and female. Gender roles are affected by age, class, race, ethnicity, and religion and by geographical, economic and political environment. Changes in gender roles often occur in response to changing economic, natural or political circumstances, including development efforts.

Both men and women play multiple roles in society. The gender roles of women can be identified as reproductive, productive and community managing roles, while men's are categorized as either productive or community politics. Men are able to focus on a particular productive role, and play their multiple roles sequentially. Women, in contrast to men, must play their roles simultaneously, and balance competing claims on time for each of them.

Productive roles

Refer to the activities carried out by men and women in order to produce goods and services either for sale, exchange, or to meet the subsistence needs of the family. For example in agriculture, productive activities include planting, animal husbandry and gardening that refer to farmers themselves, or for other people as employees.

Reproductive roles

Refer to the activities needed to ensure the reproduction of society's labour force. This includes child bearing, rearing, and care for family members such as children, elderly and workers. These tasks are done mostly by women.

Community managing role

Activities undertaken primarily by women at the community level, as an extension of their reproductive role, to ensure the provision and maintenance of scarce resources of collective consumption such as water, health care and education. This is voluntary unpaid work undertaken in 'free' time.

Community politics role

Activities undertaken primarily by men at the community level, organizing at the formal political level, often within the framework of national politics. This work is usually undertaken by men and may be paid directly or result in increased power and status.

Triple role/ multiple burden

These terms refer to the fact that women tend to work longer and more fragmented days than men as they are usually involved in three different gender roles - reproductive, productive and community work.

Gender Needs

Leading on from the fact that women and men have differing roles based on their gender, they will also have differing gender needs. These needs can be classified as either strategic or practical needs.

Practical Gender Needs (PGN):

Practical gender needs are the needs women identify in their socially accepted roles in society. PGNs do not challenge, although they arise out of, gender divisions of labour and women's subordinate position in society. PGNs are a response to immediate and perceived necessity, identified within a specific context. They are practical in nature and often concern inadequacies in living conditions such as water provision, health care and employment.

Strategic Gender Needs (SGN):

Strategic gender needs are the needs women identify because of their subordinate position in society. They vary according to particular contexts, related to gender divisions of labour, power and control, and may include issues such as legal rights, domestic violence, equal wages and women's control over their bodies. Meeting SGNs assists women to achieve greater equality and change existing roles, thereby challenging women's subordinate position. They are more long term and less visible than practical gender needs.

Feminization of Agriculture

In many parts of the world today, there is an increasing trend towards what has been termed the 'feminization of agriculture'. As men's participation in agriculture declines, the role of women in agricultural production becomes ever more dominant. War, sickness and death from HIV/AIDS have reduced rural male populations. Another major cause of this phenomenon is the migration of men from rural areas to towns and cities, in their own countries or abroad, in search of paid employment.

With a shortage of labour and capital, women heads of household are often forced to make adjustments to cropping patterns and farming systems. These adjustments have resulted in decreases in production and, in some cases, shifts towards less nutritious crops. Not surprisingly, these households often suffer from increased malnutrition and food insecurity.

Gender Issues in Agriculture

- Feminization of agriculture
- Overburden of work
- Impact of technology
- Facilities and support services
- Development bias
- Constraints to women's access to resources
- Access to land
- Access to credit
- Access to markets
- Research and technology development
- Access to extension and training
- Women's education
- Training and capacity building of farm women

Gender Analysis

Gender analysis is the first and most critical step forward towards gender-responsive planning and programming. It involves the collection and analysis of sex-disaggregated information. It examines the differences, commonalities and interactions between women and men. Gender analysis examines women's and men's specific activities, conditions, needs, access to and control over resources, and access to development benefits and decision-making.

Because both men and women perform different roles, they may have different experiences, knowledge, talents and needs. Gender analysis explores these differences so that policies, programs and projects can identify and meet the different needs of men and women.

There are several frameworks and methodologies to conduct a Gender analysis in development related fields: The Moser Framework, the Harvard Analytical Framework, the Social-relations Framework, the Longwe Framework and more. Each model has its strengths and weaknesses. Some are useful for micro-planning and give greater importance to gender roles (Harvard Framework), while others emphasise the enquiry into social relations. Some have been designed to exclusively look at women's empowerment (Longwe Framework).

To conduct a Gender Analysis, a core set of issues should be addressed. These are:

Women's and men's roles	Who does what, with what resources? Paying particular attention to variations within sub-groups of women and men (eg: elderly women, adolescent girls, men from urban areas, etc). Typically, women perform three kinds of roles:- Productive roles (paid or not);- Reproductive roles (sustaining family living conditions and basic needs - usually unpaid work), and - Community role.
Factors that shape gender roles and gender division of work	Depending on the circumstances, traditions and the institutions that shape gender roles represent constraints and/or opportunities for women and men. Understanding to what extent, and when, they are the one or/and the other is critical to designing culturally appropriate programmes and projects.
Access to and control over resources and opportunities, and their systems of distribution	Not all men and women have the same access to and control over resources and opportunities. Understanding the mechanisms and rules by which the resources and benefits are distributed is important to assess the situation of women vis-à-vis men (and vice versa) and determine the most effective entry points for action.
Access to and participation in decision making processes	Who decides? How are decisions taken concerning women's and men's lives and those of their families? Are women and men equally represented or given an opportunity to influence such processes?
Men's and women's practical and strategic needs and interests.	Given their respective roles, who needs what for what purpose?

Gender Budgeting

What is Gender Budgeting?

Gender Budgeting is a dissection of the Government budget to establish its gender-differential impacts and to translate gender commitments into budgetary commitments. Thus, Gender Budgeting looks at the Government budget from a gender perspective to assess how it addresses the needs of women in the areas like health, education, employment, etc. Gender Budgeting does not seek to create a separate budget but seeks affirmative action to address specific needs of women. Gender Responsive Budgeting initiatives provide a way of assessing the impact of Government revenue and expenditure on women. **Why Gender Budgeting?** Budgets are universally accepted as a powerful tool in achieving development objectives and act as an indicator of commitment to the stated policy of the Government. **National budgets reflect how governments mobilize and allocate public resources, and**

how they aim to meet the social and economic needs of their people. The rationale of gender budgeting arises from recognition of the fact that national budgets impact various sections of the society differently through the pattern of resource allocation and priority accorded to competing sectors. The budgetary policy of the Government has a major role to play in achieving objectives of gender equality and growth through content and direction of Fiscal and Monetary Policies, measures for resource mobilization, affirmative action for under privileged sections etc. Women stand apart as one segment of the population that warrants special attention due to their vulnerability and lack of access to state resources. **Thus, gender responsive budgets policies can contribute to achieving the objectives of gender equality, human development and economic efficiency.** The purpose of gender budgeting exercise is to assess quantum and adequacy of allocation of resources for women and to establish the extent to which Gender commitments are translated into budgetary commitments. This exercise facilitates increase in **accountability, transparency and participation of the community.** The macro policies of the Government can have a significant impact on gender gaps in various macro indicators related to health, education, income etc. Gender mainstreaming requires gender responsive policy. When gender equality considerations are incorporated into policy making, the concerns and needs of both women and men become integral part of the design, implementation, monitoring and evaluation of policies and programmes in all sections of society.

Evolution of the concept of Gender Budgeting

The perspective on gender budgeting has greatly evolved over the last few years from the initial post facto, statistical exercise that sought to establish quantum of resources allocated for women in the Union and State Budgets. The range of Gender Budget Analysis is now perceived as a mandate to examine with a gender perspective

- Public Policies- Fiscal and Monetary, Trade Tariffs etc.
- Budgetary allocations for various sectors and sections of the Economy- For eg. allocation in the social sector for Education, Health etc.
- Content and direction of various schemes and programmes- reservation of benefits for women in Food for Work
- Implementation of various schemes and projects and incidence of benefit-Achievement of targets,
- Public expenditure and impact on macro indicators like literacy, participation in work force, MMR etc.

Gender Mainstreaming - The new mantra

The conventional approach to Gender budgeting, i.e. isolating public expenditure- direct and indirect – for women, would continue to be a core activity under the broad gender budgeting exercise with future action concentrating on fine tuning methodology and universalizing the tools for application at all levels of public expenditure.

However, a broader perspective is emerging under the concept of Gender Budgeting- Gender Mainstreaming. The gender perspective on Public Expenditure and Policy is no longer restricted to the realm of social sector Departments like Education, Health, Rural Development etc. All areas of public expenditure, Revenue and Policy need to be viewed with a gender perspective.

It is necessary to recognize that women are equal players in the economy whether they participate directly as workers or indirectly as members of the care economy. To that extent, every policy of the Government fiscal, monetary or trade, has a direct impact on the well being of women. Thus, it is not adequate to analyze in detail, allocation of resources for a few sectors of the economy which are traditionally considered as women related. The analysis has to cover every rupee of public expenditure. It has to cover the way schemes are conceptualized and how women friendly they are in implementation and targeting of beneficiaries. It has to embrace a gender sensitive analysis of Monetary policies, covering impact of indicators like inflation, interest rates etc., and Fiscal policies covering taxation, excise etc. Thus, gender budgeting analysis has to go hand in hand with gender mainstreaming. This is a mammoth task in the current scenario when there is a lot of disaggregated data which has to be gender sensitized and analyzed. Micro studies will have to be conducted to study the impact of public and fiscal policy so that they may guide macro policies. Thus, a wide gamut of activities needs to be undertaken for gender mainstreaming.

Gender Commitments enshrined in Policies

The plan documents have over the years reflected the evolving trends in gender matters.

The **Seventh Plan** introduced the concept of monitoring of 27 beneficiary oriented schemes for women by DWCD. The exercise continues and number of schemes covered is being expanded.

The **Eighth Plan** (1992-97) highlighted for the first time a gender perspective and the need to ensure a definite flow of funds from the general developmental sectors to women. The Plan document made an express statement that “...the benefits to development from different sectors should not by pass women and special programmes on women should complement the general development programmes. The later, in turn, should reflect great gender sensitivity”.

The **Ninth Plan** (1997-2002) adopted ‘Women Component Plan’ as one of the major strategies and directed both the Central and State Governments to ensure “not less than 30 per cent of the funds/benefits are earmarked in all the women’s related sectors. Special vigil advocated on the flow of the earmarked funds/benefits through an effective mechanism to ensure that the proposed strategy bringsforth a holistic approach towards empowering women.

The **National Policy for Empowerment of Women 2001** envisaged introduction of a gender perspective in the budgeting process as an operational strategy.

Tenth Plan reinforces commitment to gender budgeting to establish its gender-differential impact and to translate gender commitments into budgetary commitments.

The Approach Paper to the **Eleventh Five Year Plan** mentions “Gender Equity requires adequate provisions to be made in policies and schemes across Ministries and Departments. It also entails ‘**strict adherence to gender budgeting across the board**’.

Strategic Framework of Gender Budgeting Activities

After a consultation process, the Ministry of Women and Child Development has adopted “Budgeting for Gender Equity” as the Mission Statement for this initiative and has drawn up a Broad Framework of Activities that would constitute action areas for gender mainstreaming.

Quantification of allocation of resources for women in the Union, States and Local Administration budgets and expenditure thereof:

- Refining and standardizing methodology and development of tools.
- Trend Analysis

- Analysis of change in pattern, shift in priorities in allocation across clusters of services etc.
- Variations in allocation of resources and actual expenditure
- Adherence to physical targets

Gender Audit of policies of the Government- monetary, fiscal, trade etc. at the Centre and State levels

- Research and micro studies to guide macro policies like credit policy, taxes etc. Identification of gender impact of policies/interventions viewed as gender neutral
- Micro studies to identify need for affirmative action in favour of women towards correcting gender imbalances

Impact assessment of various schemes in the Union and State budgets

- Micro studies on incidence of benefits
- Analyzing programmes, strategies, interventions and policy initiatives **from the perspective of their impact on status of women as reflected in important Macro Indicators** like literacy, MMR, participation in work force
- Eg: analysis of substance and content of various interventions directed at health of women and correlate the same with indicator like MMR to establish need for corrective action in formulation of scheme/ approach.

Institutionalizing the generation and collection of gender dis-aggregated data of cost of delivery of services

- Developing MIS for feed back from implementing agencies
- Inclusion of new parameters in data collection in Census and surveys by NSO, CSO etc.

Consultations and Capacity building

- Collation of research and exchange of best practices
- Developing methodologies and tools for dissemination Forums and Partnerships amongst experts and stakeholders.

Review of decision-making processes to establish gender equity in participation

- Review of the extent of participation of women in decision making processes, and to establish processes and models aimed at gender equity in decision making and greater participation of women.
- Formulation and reflection of satellite accounts to capture the contribution of women to the economy by way of their activities in areas that go unreported like care economy, unpaid work in rearing domestic animals etc.

Tools of Gender Budgeting

Guidelines for Gender Sensitive Review of Public Expenditure and Policy

These have been framed by the Department of Women and Child Development in the form of checklists I and II. Checklist-I is for programmes that are beneficiary oriented and consciously target women. Checklist-II covers mainstream sectors.

Checklist-I for Gender Specific Expenditure

Conventionally, gender budget analysis, by way of isolation of women related expenditure, has been carried out for Ministries/Departments like Health and Family Welfare, Rural Development, Human Resource Development, Urban Employment and Poverty Alleviation, Youth and Sports Affairs, Labour, Social Justice and Empowerment, Tribal Affairs, Drinking Water, Small Scale Industries and Agro and Rural Industries, Science and Technology, Non-Conventional Energy Sources, Textiles and Agriculture.

Suggested steps that may be undertaken by these various Ministries/Departments who are running programmes/schemes of a gender specific nature i.e. where the targeted beneficiaries are primarily women are as follows:

Planning and Budgeting

- **List of schemes and programmes** which are **gender specific**
- Briefly indicating **activities undertaken** under the programme for women.
- Indicating expected **output indicators** like number of women beneficiaries, increase in employment of women, post project increase in resources/ income/ skills etc.

- **Quantifying allocation of resources** in annual budget and physical targets thereof.
- Assessing **adequacy of resource** allocation in terms of population of targeted beneficiaries that need the concerned schematic intervention, the trend of past expenditure etc.

Performance Audit

- Reviewing actual performance- physical and financial vis-a-vis the annual targets and **identifying constraints** in achieving targets (like need for strengthening delivery infrastructure, capacity building etc.)
- Carrying out **reality check- Evaluation of programme intervention**, incidence of benefit, identifying impact indicators like comparative status of women before and after the programme etc.
- Compiling a trend analysis of expenditure and output indicators and impact indicators.

Future Planning and Corrective Action

- **Addressing constraints** identified from steps.
- Establishing requirement of Resources in terms of population of targeted beneficiaries/magnitude of perceived problems like IMR, MMR, literacy ratio etc.
- Reviewing **adequacy of resources** available – financial and physical like trained manpower etc.
- Planning for **modification in policies and/or programmes/schemes** based on results of review.

Checklist-II for mainstream sectors

- Mainstream sectors like Defence, Power, Telecom, Communications, Transport, Industry, Commerce etc. may consider adopting the following checklist to determine the gender impact of their expenditure.
- List of all programmes entailing public expenditure with a brief description of activities entailed.
- Identifying target group of beneficiaries/users.
- Establishing whether users/beneficiaries are being categorized by sex (male/female) at present and if not to what extent would it be feasible.

- Identify possibility of undertaking special measures to facilitate access of services for women - either through affirmative action like quotas, priority lists etc. or through expansion of services that are women-specific like all women police stations, women's special buses etc.
- Analyzing the employment pattern in rendering of these services/programmes from a gender perspective and examining avenues to enhance women's recruitment.
- Focus on special initiatives to promote participation of women either in employment force or as users.
- Indicating the extent to which women are engaged in decision-making processes at various levels within the sector and in the organizations and initiating action to correct gender biases and imbalances.
- These exercises can be commenced by each Ministry/Department of the Government, to start with, for a few select programmes/schemes which may be selected either in terms of their perceived gender impact, or the selection can be based on considerations of heaviest budget allocation. Based on the result of carrying out the above steps, the gender budgeting exercise may be institutionalized in the manner detailed in checklist-I. A few illustrative examples of gender initiatives in mainstream sectors are given below:

a. Priority in awarding commercial/domestic power connections for women entrepreneurs, widows, households headed by women, etc. Priority in allocation of industrial licenses/commercial plots/petrol pumps and gas stations for women, women cooperatives/self help groups etc.

b. Gender Profile of Public Expenditure: This entails review of all schemes and public expenditure from a gender perspective and isolating the gender component by way of expenditure and physical targets. Trend of the gender component is indicative of the extent to which budgeting is gender responsive.

c. Beneficiary Needs Assessment: Establishing requirements from the point of view of women and reviewing effectiveness of public expenditure accordingly.

d. Impact Analysis: Establishing actual impact of public expenditure and policies from gender perspective, through monitoring, evaluation and field level surveys. This would include tracking flow of intended benefits.

e. Gender-Disaggregated Public Expenditure Benefit Incidence Analysis: This entails analysis of the extent to which men and women benefit from expenditure on publicly provided services.

f. Gender-disaggregated Revenue Incidence Analyses

This entails analysis of the different effects on women and men produced by the kind of revenues raised by governments. It seeks to understand the gender perspective of direct (income, corporate taxes) and indirect taxes (value added tax) and user fees.

Gender Budgeting – State level

In the meeting of the National Development Council held on 27-28 June 2005, the Prime Minister has emphasized upon the need for State Governments to join hands in this area.

”The issue of gender bias is another area which needs focused attention. In the Union Budget for 2005-06, we have made a beginning in gender budgeting by incorporating a separate statement highlighting gender sensitivities of budgetary allocations under 10 Demands for Grants, to be extended to all Central Ministries. But this task will remain incomplete unless all the States join hands in ensuring development justice to women. This is one of the important instruments to tackle the growing violence against women, which begins even before their birth and continues through their entire life span. It cuts across caste, class, community and prevails in all parts, rural and urban. This is the right forum to pledge our wholehearted and unequivocal support for ensuring a violence-free world for our women and girl children.”

The State Governments collectively reflect a higher amount of women related expenditure than GOI.

Increasing trend in Public Expenditure on Women: Over the decade 1993-94 to 2002-03, the total expenditure on women development has increased from Rs. 1083.57 crores in 1993-94 to Rs.3719.16 crores in 2002-03 (B.E.).

The share of the Central Government has ranged between 40% to 50% in expenditure on women.

The above position only reinforces the importance of extending Gender Budgeting initiatives to the State Governments. Further, implementation of all important GOI schemes is with State Governments. Thus, any exercise in Gender Budgeting is incomplete without State Government initiatives. States could consider setting up Gender Budget Cells in key Departments.

Role of GB Cells

- Act as a nodal agency for all gender responsive budgeting initiatives.
- Pilot action on gender sensitive review of public expenditure and policies (Expenditure/ Revenue/Policies/Legislation etc.) as per Checklist I and II
- Guide and undertake collection of gender disaggregated data- for target group of beneficiaries covered under expenditure, revenue raising/ policy/ legislation
- Guide gender budgeting initiatives within Departments as well as in field units responsible for implementing government programmes.
- Conduct gender based impact analysis, beneficiary needs assessment and beneficiary incidence analysis to establish effectiveness of public expenditure, Identify scope for re-prioritization of public expenditure, Improve implementation etc.
- Collate and promote best practices on participative budgeting for and implementation of schemes

Guidelines for Mainstreaming Gender

Gender must be integrated into ALL stages of the project cycle.

Project formulation and design

1. Ensure gender issues during fact-finding missions and incorporated into the project concept/outline paper, over viewing the different roles, functions and needs of women and men in the sector,
2. Ensure gender is incorporated into the terms of reference for the identification/ formulation mission to address and analyse the issue,
3. Employ a gender specialist or a social development specialist with gender expertise to assist in the design, monitoring and evaluation of the project. Also employ/deploy staff (both men and women) in proper ratio at decision making level and field level positions,
4. Separate data by sex in all baseline studies and identify gender specific indicators from the baseline studies
5. Undertake participatory rural appraisal activities that involve community level women and men actively,
6. Assess the gender capacity of the implementing institutions as a part of overall capacity development.

Issues to remember:

- Identify any anticipated negative impacts of the project on women and men (e.g. increased workload, loss of access to resources such as credit, water, land and technology);
- Identify any constraints to women's participation and make concrete recommendations for increasing women's involvement (e.g. ensure that meetings are not held outside work hours or that childcare needs are considered).

Project implementation and monitoring

1. Involve gender specialists in project monitoring
2. Consult women's groups or their representatives to ensure that women's needs are addressed in project activities
3. Devise and measure gender indicators to differentiate male and female beneficiary outcomes
4. Ensure programme staff monitor project disbursements to ensure that inputs are used in such a way as to ensure women have equal access to project resources and benefits
5. Strive towards equal representation of women and men in project management and meetings
6. Ensure gender issues are raised/on the agenda for meetings and reviews;
7. Ensure progress reports detail data disaggregated by sex and that they analyse gender issues
8. Conduct gender analysis training for your staff and counterparts or fund a gender specialist to do this; Strive towards equal representation of men and women in all training activities
9. Ensure the programme staff understands and applies gender indicators of success

Project Review and Evaluation

Impact of the project interventions on men and women in terms of:

1. Strengthening leadership and capacities of women and men
2. Gaining new skills (financial, managerial, organizational, technical etc.)
3. Access and control over resources and technology as against the situation prior to the intervention
4. Impact of programme in terms of increased economic returns and enhancement of new economic opportunities for men and women
5. Nature of sharing benefits from programme between men and women

6. Impact of the programme on women's practical and strategic gender needs (education, health, improved employment opportunities, political status, violence, land entitlements etc.)
7. What were the driving and restraining factors in the process of planning, implementation and monitoring of the project?
8. What are the key lessons learnt?

Strategies for Mainstreaming Gender

1. Organizing Women Groups:
Male extension workers can be trained to work more closely with women in settings that are culturally acceptable, such as women groups. Such groups can also improve access to infrastructure.
2. Technologies to reduce energy and time spent, particularly the household and farm production activities. Extending the technological innovations such as weeders, paddy threshers, winnowers, sprayers, harvesting tools, parboiling units, maize shellers, dal making machines etc., will reduce the burden of women.
3. Increasing the bio mass production to meet fuel needs, plantation of fast growing fodder in common lands and developing mechanisms for sharing the fodder helps women in saving lot of time and devote this time for income generating activities.
4. Innovative credit programmes using non-traditional forms of collateral and local institutions (women groups) can ensure that women are able to obtain access to credit.
5. Identifying the right training and extension needs of women is one of the most important steps in initiating any developmental programme. Gender Analysis of activities, resources, constraints, implications and benefits should be understood using Participatory Approach. This information should be taken into consideration for the need assessment. The staff members' / extension functionaries' ability to do this has to be built up.
6. Giving women farmers more access to meetings, trainings, exposure visits and demonstrations, organizing training programmes based on the needs of the women. Institutional and village based trainings to be organized as per the convenience of the women farmers.
7. Where severe fragmentation exists, collective farming should be encouraged by women.

8. Farmer to farmer training or participatory training should be encouraged.
9. Active women can be selected, trained and they should be provided with inputs and credit to practice improved technology. Their fields can be used as demonstration plots for training other women.
10. Recruiting more women extension workers from rural areas and training them.
11. Female para-extension agriculturists-relatively uneducated women with short crash courses on agriculture- can be posted in their own villages.
12. Appointing female supervisors and SMSs.
13. Making better use of male extension agents; Change the stereo-typed attitude of male agents with regular gender sensitization courses; Increasing awareness of gender roles; Developing skills in use of language and communication to suit women
14. Using women as contact workers.
15. Crèches for children of women farmers. This will enable girls to go to schools.
16. Proper health care support for girls and women.
17. Most of the micro enterprises undertaken by the women are based on the skills and raw material available rather than considering the market needs and market dynamics. In-depth marketing study would help identify effective marketing strategy for products. Cooperative marketing of products and assigning brand names for the products would also be helpful in finding sustainable markets.

While developing farmwomen programmes, the cost of hiring consultants to conduct market analysis and market development should be kept in mind.

MARKET-LED AGRICULTURAL EXTENSION –CHALLENGES & FUTURE STRATEGY

Introduction

An efficient marketing system is essential for development of the agricultural sector. In as much as it provides outlets and incentives for increased production, the marketing system contributes greatly to the commercialization of subsistence farmers. Failure to develop the agricultural marketing system is likely to negate most, if not all, efforts to increase agricultural production (FAO, 2000). It is expected that future agricultural growth would largely accrue from improvements in productivity of diversified farming systems with regional specialization and sustainable management of natural resources, especially land and water, effective linkages of production systems with marketing, agro-processing and other.

The government provides much of the infrastructure required for efficient marketing. One of the most important factors is the information and extension services to farmers besides transport & communication facilities, public utility supply like water & electricity, fiscal and trade administering and public storage, market and abattoir facilities (FAO, 2000).

In the changing scenario of Indian agriculture, with the newly added face of marketing, the extension system is likely to undergo series of crises:

Knowledge-skill input crisis: Besides the production technologies, the extensionists now have to get equipped with market information which requires further training to the extensionists and additional funding.

Efficacy crisis: Already, the extension system is under criticism. With the increased and enriched role, they have to perform multiple activities to prove their efficacy.

Credibility crisis: Even with all the market knowledge and efficacy in performing their role, the extension system may face the credibility crisis due to rapid and unexpected changes in the market.

Reorganization structure crisis: With assumption of new roles, the organization structure may be prone to changes and the system has to adjust itself to this shock.

Challenges

- The gigantic size/mechanism of the public extension system in the country is heavily burdened with performance of multifarious activities in the field. Extension system acted as liaison between the researcher and farmer. They are endowed with the responsibility of conveying farmers' needs to the scientists. The new dimension of marketing may overburden and become an agenda beyond their comprehension and capability. The public extension system is already under severe criticism for delivering the services. In the light of this scenario, the challenge remains to motivate the extension personnel to learn the new knowledge and skills of marketing before assigning them marketing extension jobs to establish the credibility and facilitate significant profits for the farming community.
- Sporadic success stories of using information technology by farmers are publicized. There is an urgent need to strategically frame an information policy to make the farmer info-rich. Internal technology has percolated down up to Taluq level and in some states up to village level. Search engines and various websites furnish general information presently. Agricultural Market related information is not available readily on the Internet. Hence, a whole network of skilled personnel need to be engaged in collection of current information and creation of relevant websites pertaining to/serving specific needs of farmers. Creation of websites should be mandatory in different languages to equip the farmers with information. These websites should contain information like market networks, likely price trends, current prices, demand status etc.

In short, Kipling's seven servants may be employed to get answers to questions like what and how much to produce, when to produce, in what for to sell, at what price to sell, when to sell and where to sell. Information technology should be able to provide this kind of information to the farmers with 'press a button' on the computer on a continuous updated basis. Then and only then, the much talked about IT revolution would be beneficial to farmers.

- Generation of data on market intelligence would be a huge task by itself. Department of market already possess much of the data. Hence, establishment of linkages between agriculture and line department and departments of Market strengthens the market-led extension.

- Extension cadre development poses a new challenge to the newly designed role. The present extension system suffers from several limitations of stationary, mobility, travel allowances, personnel development, etc. There is a dire need to upgrade these basic facilities and free the extension cadres from the shackles of the hygiene factors and enthuse them to look forward for motivating factors like achievement, job satisfaction, recognition etc.
- Re-organization of the extension system like the position of Additional Director Extension may be re-designated as Additional Director Extension and Marketing and be made to look after both extension and marketing.

Enhanced role of Agricultural Extension Personnel in light of Market-Led Extension

- SWOT analysis of the market: Strengths (demand, high marketability, good price etc.), weaknesses (the reverse of the above), Opportunities (export to other places, appropriate time of selling etc.) and Threats (imports and perishability of the products etc.) need to be analyzed about the markets. Accordingly, the farmers need to be made aware of this analysis for planning their production and marketing.
- Organization of Farmer's Interest Groups (FIGs) on commodity basis and building their capabilities with regard to management of their farm enterprise.
- Supporting and enhancing the capacities of locally established groups under various schemes/programmes like watershed committees, user groups, SHGs, water users' associations, thrift and credit groups. These groups need to be educated on the importance, utility and benefit of self-help action.
- Enhancing the interactive and communication skills of the farmers to exchange their views with customers and other market forces (middlemen) for getting feedback and gain by bargaining during direct marketing ex. Rythu Bazars, Agri-mandi and Uzavar Santhaigal etc.
- Establishing marketing and agro-processing linkages between farmers' groups, markets and private processors.
- Advice on product planning: selection of crops to be grown and varieties suiting the land holding and marketability of produce will be the starting point of agri-enterprise. Extension system plays an important role in providing information in this regard.
- Educating the farming community: To treat agriculture as an entrepreneurial activity and accordingly plan various phases of crop production and marketing.

- Direct marketing: Farmers need to be informed about the benefits of direct marketing. In some of the states, Rytu Bazars in Andhra Pradesh, Apni Mandis in Punjab and Haryana and Uzavar Santhaigal in Tamil Nadu have shown success.
- Capacity building of FIGs in terms of improved production, post harvest operations, storage, transport and marketing.
- Acquiring complete market intelligence regularly on various aspects of markets.
- Regular usage of internet facility through computers to get updated on market intelligence
- Publication of agricultural market information in news papers, radio and television besides internet.
- Organization of study tours on FIGS to successful farmers/FIGs for various operations with similar socio-economic and farming systems as the farmers learn more from each other
- Production of video films of success stories of commodity specific farmers
- Creation of websites of successful FIGs in the field of agribusiness management with all the information to help other FIGs achieve success.

Required information to extension system and farmers:

- Present agricultural scenario and land use pattern
- Suitability of land holding to various crops/enterprises
- Crops in demand in near future
- Market prices of crops in demand
- Availability of inputs
- Credit facilities
- Desired qualities of the products by consumers
- Market network of the local area and the price differences in various markets
- Network of storage and warehouse facilities available
- Transport facilities
- Regular updating of market intelligence
- Production technologies like improved varieties, organic farming, usage of bio-fertilizers and bio-pesticides, IPM, INM, and right methods of harvesting etc.
- Post-harvest management like processing, grading, standardization of produce, value addition, packaging, storage, certification etc. with reference to food grains, fruits and vegetables, eggs, poultry, fish etc.

Paradigm shift from production-led Extension to Market-led Extension

Aspects	Production-led extension	Market-led extension
Purpose/objectives	Transfer of production technologies	Enabling farmers to get optimum returns out of the enterprise
Expected end results	Delivery of messages Adoption of package of practices by most of the farmers	High returns
Farmers seen as	Progressive farmers High producer	Farmer as an enterprise “Agripreneur”
Focus	Production/yields “Seed to seed”	Whole processes as an enterprise/ High returns “Money to money”
Extensionists’ interactions	Messages Training Motivating Recommendations	Joint analysis of the issues Varied choices for adoption Consultation
Extensionists’ role	Limited to delivery mode and feedback to research system	Enriched with the market intelligence besides the TOT function... Establishment of marketing and agro-processing linkages between farmer groups, markets and processors
Contact with farmers	Individual	Farmers’ Interest Groups, Focused groups/SHGs
Information Technology support	Emphasis on production technologies	Market intelligence including likely price trends, demand position, current prices, market practices, communication net work, etc., besides production technologies

Climate change and its Impact on Agriculture

Introduction

India is a large developing country with nearly 55% of the population depending directly on the climate sensitive sectors such as agriculture, fisheries and forests (GOI). The projected climate change under various scenarios is likely to have implications on food production, water supply, biodiversity and livelihoods. A large part of the Indian agriculture depends on monsoon so that the market of agriculture, essential commodities shows fluctuation due to early/delayed arrival of monsoon. Any change in country's rainfall pattern impacts agriculture, and hence the country's economy and food security. Yet global warming poses serious threats to the weather system, which can potentially affect millions of small, marginal and poor farmers and all those who depend on agriculture for their livelihood (Mitra Amit, 2009).

Agriculture typically plays a larger role in developing economies than in the developed world. For example, agriculture in India makes up roughly 17% of GDP (GOI) and provides nearly 52% of employment. Furthermore, agricultural productivity is particularly important for the well being of the poor. The rapid increase in population and economic development has led to severe environmental degradation that undermines the environmental resource base upon which sustainable development depends. The economics of environmental pollution, depletion and degradation of resources have infact been neglected as compared to the issues of growth and expansion. India has been no exception to this worldwide phenomenon. The trends of environmental deterioration in India, because of the substantial increase in its population, have been far more prominent as compared to other developing economies.

Agriculture in India

No doubt agriculture is the backbone of Indian economy. The share of agricultural products in exports is also substantial, with agriculture accounting for 15% of export earnings. Agricultural growth also has a direct impact on poverty eradication, and is an important factor in employment generation. The agricultural sector is a driving force in gas emissions and land use effects that causes climate change. In addition, being a significant user of land and consumer of fossil fuel, agriculture contributes directly to greenhouse gas emissions through practices such as rice production and the raising of livestock (FAO, 2007). According to the

Intergovernmental Panel on Climate Change (IPCC), the three main causes of the increase in greenhouse gases observed over the past 250 years have been fossil fuels, land use, and agriculture (IPCC 2001). A growing world population combined with the steady effects of climate change is a forecast to create a global food shortage in the next 10 years. India is not exceptional; its 52% working population depend on agriculture and nearly 70% population resided in rural areas where agriculture is largest support to livelihoods. (Economic Outlook 2010-11). As climate changes, a key driver for agriculture in 21st century, there will be increase in the demand for food in India to 276 million tons by 2021 as against current production of 230 million tons that may increase the competition for resources use such as land, water, capital, labour and other precious natural resources.

The average temperature of the earth has been on a steady rise ever since the beginning of the Industrial Revolution, when people began burning fossil fuels for energy. In India, while the wheat crop is vulnerable to an increase in maximum temperature, the rice crop is sensitive to an increase in minimum temperature. Acute water shortage, combined with temperature stress, negatively affects both wheat and rice productivity in north-west India.

Out of the total 329 million hectares of geographical area 174 million hectares or 53% of the total land area in India is suffering from serious degradation. Of this, the area that is subject to water and wind erosion amounts to 144 million hectares, and the area degraded through special problems like ravines, salinity, water logging etc., accounted for another 30 million hectares (Koty Reddy T. 2010). One-third of our land is under forests, nearly two-thirds of land is under agriculture and nearly all cultivable waste lands, permanent pastures and grazing lands are in urgent need of conservation measures (K.G.Tejawani 1982). The effects of haphazard grazing on the environment are alarming. Land degradation due to overgrazing has led to desert like conditions in many parts of the country.

There are a few Indian studies on this theme and they generally confirm similar trend of agricultural decline with climate change. Recent studies done at the Indian Agricultural Research Institute (IARI) indicate the possibility of loss of 4 – 5 million tons in wheat production in future with every rise of 1°C temperature throughout the growing period (but no adaptation benefits). It also assumes that irrigation would remain available in future at today's levels. Losses for other crops are still uncertain but they are expected to be relatively smaller, especially for *khari* crops. According to Sinha and Swaminathan (1991), an increase of 2°C in temperature could

decrease the rice yield by about 0.75 ton per hectare in the high yield areas; and 0.5°C increase in winter temperature would reduce wheat yield by 0.45 tons/ha. Rao and Shina (1994) showed that wheat yields could decrease between 28-68% without considering the CO₂ fertilization effects. Agarwal and Sinha (1993) showed that a 2°C temperature rise would decrease wheat yields in most places. Saseendran et al. (2000) showed that for every one-degree rise in temperature the decline in rice yield would be about 6%. Recent IPCC report and a few other global studies indicate a probability of 10 to 40% loss in crop production in India with increases in temperature by 2080 – 2100.

Climate change: Meaning

For most people, the expression “climate change” means the alteration of the world’s climate that we humans are causing, through fossil fuel burning, clearing forests and other practices that increase the concentration of greenhouse gases (GHG) in the atmosphere. This is in line with the official definition by the United Nations Framework Convention on Climate Change (UNFCCC) that climate change is the change that can be attributed “*directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to natural climate variability observed over comparable time periods*”.

However, scientists often use the term for any change in the climate, whether arising naturally or from human causes. In particular, the Intergovernmental Panel on Climate Change (IPCC) defines “climate change” as “*a change in the state of the climate that can be identified ... by changes in the mean and / or the variability of its properties, and that persists for an extended period, typically decades or longer*”.

Weather and climate

Weather is the set of meteorological conditions – wind, rain, snow, sunshine, temperature, etc. – at a particular time and place. By contrast, the term “climate” describes the overall long-term characteristics of the weather experienced at a place.

The ecosystems, agriculture, livelihoods and settlements of a region are very dependent on its climate. The climate therefore can be thought of as a long-term summary of weather conditions, taking account of the *average conditions* as well as the *variability of these conditions*. The fluctuations that occur from year to year, and the statistics of extreme conditions such as severe storms or unusually hot seasons, are part of the climatic variability. Some slowly changing climatic phenomena can last

for whole seasons or even years; the best known of these is the El Nino phenomenon. Since the atmosphere connects all weather systems and all climates, it is sometimes useful to describe the atmosphere, oceans and Earth surface as the “global climate system”. Because the climate system is in a constant state of flux and has always exhibited natural fluctuations and extreme conditions, it is not possible to argue that any single extreme event is attributable to climate change. Only after a sufficient period and with hundreds of extreme events recorded, scientists can determine if a specific event is within normal historical variation or is due to some other cause such as climate change.

Causes of climate change

The Earth’s climate has varied considerably in the past, as shown by the geological evidence of ice ages and sea level changes, and by the records of human history over many hundreds of years. The causes of past changes are not always clear but are generally known to be related to changes in ocean currents, solar activity, volcanic eruptions and other natural factors. The difference now is that global temperatures have risen unusually rapidly over the last few decades. There is strong evidence of increases in average global air and ocean temperatures, widespread melting of snow and ice, and rising average global sea levels. The IPCC Fourth Assessment Report concludes that the global warming is unequivocal. Atmosphere and ocean temperatures are higher than they have been at any other time during at least the past five centuries, and probably for more than a millennium. Scientists have long known that the atmosphere’s greenhouse gases act as a “blanket” which traps incoming solar energy and keeps the Earth’s surface warmer than it otherwise would be, and that an increase in atmospheric greenhouse gases would lead to additional warming. The current concentration of greenhouse gases in the atmosphere is now the highest it has been for the past 500,000 years, having grown by 70% between 1970 and 2004 alone, and having reached this level exceptionally quickly. While there has been some controversy in the past, it is now widely accepted that human activities, in particular fossil fuel use and changing land-uses, are the dominant factors in this growth and are responsible for most of the warming observed over the past 50 years.

Main projections for climate change

The projections of future climate patterns are largely based on computer-based models of the climate system that incorporate the important factors and processes of the atmosphere and the oceans, including the expected growth in

greenhouse gases from socio-economic scenarios for the coming decades. The IPCC has examined the published results from many different models and on the basis of the evidence has estimated that by 2100-

- The global average surface warming (surface air temperature change) will increase by 1.1 - 6.4 °C.
- The sea level will rise between 18 and 59 cm.
- The oceans will become more acidic.
- It is very likely that hot extremes, heat waves and heavy precipitation events will continue to become more frequent.
- It is very likely that there will be more precipitation at higher latitudes and it is likely that there will be less precipitation in most subtropical land areas.
- It is likely that tropical cyclones (typhoons and hurricanes) will become more intense, with larger peak wind speeds and more heavy precipitation associated with ongoing increases of tropical sea surface temperatures.

Likely Effects of climate change on key sectors

The IPCC Fourth Assessment Report of the Working Group II “Impacts, Adaptation and Vulnerability” describes the likely effects of climate change, including from increases in extreme events. The effects on key sectors, in the absence of countermeasures, may be summarized as follows:

Water: Drought-affected areas will likely become more widely distributed. Heavier precipitation events are very likely to increase in frequency leading to higher flood risks. By mid-century, water availability will likely decrease in mid-latitudes, in the dry tropics and in other regions supplied by melt water from mountain ranges. More than one sixth of the world’s population is currently dependent on melt water from mountain ranges.

Food: While some mid-latitude and high-latitude areas will initially benefit from higher agricultural production, for many others at lower latitudes, especially in seasonally dry and tropical regions, the increases in temperature and the frequency of droughts and floods are likely to affect crop production negatively, which could increase the number of people at risk from hunger and increased levels of displacement and migration.

Industry, settlement and society: The most vulnerable industries, settlements and societies are generally those located in coastal areas and river flood plains, and those whose economies are closely linked with climate sensitive resources. This applies particularly to locations already prone to extreme weather events, and especially

areas undergoing rapid urbanization. Where extreme weather events become more intense or more frequent, the economic and social costs of those events will increase.

Health: The projected changes in climate are likely to alter the health status of millions of people, including through increased deaths, disease and injury due to heat waves, floods, storms, fires and droughts. Increased malnutrition, diarrhoeal disease and malaria in some areas will increase vulnerability to extreme public health and development goals will be threatened by longer term damage to health systems from disasters.

Projected Impact on Asia

- According to the study, the Asia-Pacific region will experience the worst effect on rice and wheat yields worldwide, and decreased yields could threaten the food security of 1.6 billion people in South Asia.
- The crop model indicates that in South Asia, average yields in 2050 for crops will decline from 2000 levels by about 50 percent for wheat, 17 percent for rice, and about 6 percent for maize because of climate change.
- In East Asia and the Pacific, yields in 2050 for crops will decline from 2000 levels by up to 20 percent for rice, 13 percent for soybean, 16 percent for wheat, and 4 percent for maize because of climate change.
- With climate change, average calorie availability in Asia in 2050 is expected to be about 15 percent lower and cereal consumption is projected to decline by as much as 24 percent compared to a no-climate-change scenario.
- In a no-climate-change scenario, the number of malnourished children in South Asia would fall from 76 to 52 million between 2000 and 2050, and from 24 to 10 million in East Asia and the Pacific.
- Climate change will erase some of this progress, causing the number of malnourished children in 2050 to rise to 59 million in South Asia and to 14 million in East Asia and the Pacific, increasing the total number of malnourished children in Asia by about 11 million.
- To counteract the effects of climate change on nutrition, South Asia requires additional annual investments of 1.5 billion USD in rural development, and East Asia and the Pacific require almost 1 billion USD more. Over half of these investments in both regions must be for irrigation expansion.

Additional Facts

- The Asian countries most vulnerable to climate change are Afghanistan, Bangladesh, Cambodia, India, Lao PDR, Myanmar and Nepal.
- Afghanistan, Bangladesh, India, and Nepal are particularly vulnerable to declining crop yields due to glacial melting, floods, droughts, and erratic rainfall, among other factors.
- Asia is the most disaster-afflicted region in the world, accounting for about 89 percent of people affected by disasters worldwide.
- More than 60 percent of the economically active population and their dependents - 2.2 billion people - rely on agriculture for their livelihoods in developing parts of Asia.

Impacts of climate change on Agriculture in India

Indian climate is dominated by the south-west monsoon, which brings most of the region's precipitation. It is critical for the availability of drinking water and irrigation for agriculture. Agricultural productivity is sensitive to two broad classes of climate-induced effects - (1) direct effects from changes in temperature, precipitation, or carbon dioxide concentrations, and (2) indirect effects through changes in soil moisture and the distribution and frequency of infestation by pests and diseases.

Rice and wheat yields could decline considerably with climatic changes (IPCC 1996; 2001). However, the vulnerability of agricultural production to climate change depends not only on the physiological response of the affected plant, but also on the ability of the affected socio-economic systems of production to cope with changes in yield, as well as with changes in the frequency of droughts or floods. The adaptability of farmers in India is severely restricted by heavy reliance on natural factors and lack of complementary inputs and institutional support systems.

Kumar and Parikh (1998) show that economic impact would be significant even after accounting for farm-level adaptation. The loss in net revenue at the farm level is estimated to range between 9% and 25% for a temperature rise of 2° C to 3.5 °C. Sanghi, Mendelsohn, and Dinar (1998) also attempt to incorporate adaptation options while estimating agricultural impacts. They calculate that a 2° C rise in mean temperature and a 7% increase in mean precipitation would reduce net revenues by 12.3% for the country as a whole. Agriculture in the coastal regions of Gujarat, Maharashtra and Karnataka is found to be the most negatively affected. Small losses

are also indicated for the major food-grain producing regions of Punjab, Haryana, and western Uttar Pradesh. On the other hand, West Bengal, Orissa, and Andhra Pradesh are predicted to benefit – to a small extent – from warming.

Research Finding of ICAR on Climate Change

To meet the challenges as posed by climate change on the agricultural system, ICAR has accorded high priority in understanding the impacts of climate change and developing adaptation and mitigation strategies through its network research program (NPCC) in the X plan.

Climate

- Significant negative rainfall trends were observed in the Eastern parts of Madhya Pradesh, Chhattisgarh and parts of Bihar, Uttar Pradesh, parts of northwest and NE India and also a small pocket in Tamil Nadu. Significant increase in rainfall has also been noticed in Jammu and Kashmir and in some parts of southern peninsular.
- The maximum and minimum temperature (1960-2003) analysis for northwest region of India showed that the minimum temperature is increasing at annual, *kharif* and *rabi* season time scales. The rate of increase of minimum temperature during *rabi* is much higher than during *kharif*. The maximum temperature showed increase in annual, *kharif* and *rabi* time scales but very sharp rise was observed from the year 2000 onwards.

Agriculture

- It was observed from the experiments on impact of high temperature on pollen sterility and germination in rice that maximum temperature above 35°C and minimum temperature 23°C at flowering stage increased the pollen sterility in two normal and three basmati varieties of rice, and the effect is more profound in basmati cultivars.
- Biological yields were reduced drastically with elevated ambient temperature in tunnel experiments. The degrees of reduction in grain yield enhanced with rise in ambient temperature at 1, 2 and 3°C. The reduction of grain yield by 60, 64 and 70 percent in Pusa Sugandh-2 and 45, 52, 54 percent in Pusa 44 variety which was mainly attributed to maximum reduction in number of panicles/m² followed by the number of panicles/m² and 1000 grain weight.

- High thermal stress during post-flowering duration manifested 18, 60 and 12 percent reduction in economic yield of wheat, mustard and potato, respectively.
- Coconut yields were not affected with the increase of maximum temperature upto 44°C but above then the yield got reduced .
- The growth and yield response of castor crop at first and second germination levels showed positive response to both enhanced CO₂.
- The reproductive phase (days to flowering) and maturity phase shortened by 5 and 15 days in early and late sown varieties of wheat at Palm Valley of Himachal Pradesh.
- One to ten day shortening of reproductive phase in rice was observed in Palampur region.
- Increasing temperature above 1°C in the Himalayan region is adversely affecting the yield of apple.
- In Himachal Pradesh, rainfall at low (1100m) and mid (1800-2000 m) elevation has declined and erratic. At higher ranges (2600-2700 m) snowfall has declined from 10 feet (40 years back) to 1-2 feet in the recent years.

Forests

- Deodar, Kail and Kharsu are drying and dying (yellowing) at (1700-2300 m) elevation, whereas at higher elevation (2500 m) Insect attack in oak was observed in Shimla region.

Livestock

- A rise in 2-6°C temperature impacts the growth, puberty and maturity of cross breeds and buffaloes. The time to attain puberty prolongs from 1 to 2 weeks because of the slow growth rates at higher temperature.
- Milk production in Holstein Friesian cross breed cows was affected due to rise in maximum and minimum temperatures above 22°C. Decrease of milk production in Murra buffaloes was also observed with increase in temperature above 2°C. The extreme events like heat wave (> 4°C and cold wave (< 3°C) reduced the milk yield by 10-30 percent in first lactation and 5-20 percent in second and third lactations in cattle and buffaloes. The results were in situ and not observed after the events.
- Total methane emission due to enteric fermentation and manure management of 485 million heads of livestock was worked out at 9.36 Tg/annum for the year 2006. It was 9.32 Tg/annum in the year 2003.

- The emission contribution of indigenous cattle to enteric emission was 38 percent as against 41 percent in 2003 due to decline in unproductive indigenous cattle and oxen. The contribution of buffaloes to enteric methane emission was 43 percent in 2006.
- Reduction of methane emission in cattle (cross breed steers) was achieved by modifying the diet by supplementing fenugreek seeds (*Trigonella foerum*).

Fisheries

- Trends in SST showed significant increase at the rate of 0.045°C per decade along the southwest, northwest and northeast coasts whereas the rate of increase of 0.095°C per decade was observed along the southeast coast.
- The oil sardine fish once restricted to southwest coast along 8°N to 12°N was extended along the other coastal areas and also extended into Bay of Bengal upto Orissa and West Bengal coast due to congenial environment prevailed with the increasing SSTs.
- A shift in lower stretch fish species like Puntim ticto, Xenentodon cancila, Mystus vittatus and Glossogobius giuris, etc. to the cold water rithron zone of the river Ganga at Haridwar due to rise in average temperature condition of the river from 17.5°C to 25.5°C.

Climate Variability and Foodgrains Production in India

It is important to note that the climate-sensitive sectors (forests, agriculture, coastal zones) and the natural resources (groundwater, soil, biodiversity, etc.) are already under stress due to socio-economic pressures. Climate change is likely to exacerbate the degradation of resources and socio-economic pressures. Thus, countries such as India with a large population dependent on climate-sensitive sectors and low adaptive capacity have to develop and implement adaptation strategies (Sathaye, Shukla, and Ravindranath 2006).

Indian climate is very much suitable for the cultivation of most of the crops in different parts of our country because of large scale variation in the climate across the region. But Indian soil is most suited for the cultivation of food grains particularly wheat and rice. The production of wheat is done in the Rabi season when the rain fall is limited. Because of this reason, the production of wheat was found mainly in those regions where there is availability of assured irrigation (mainly Punjab, Haryana and Western Uttar Pradesh) which helps in proper implementation of Green Revolution

and became very much limited to the Northern part of the country. Since wheat production is heavily dependent upon assured irrigation, a change in temperature is expected to affect the production of wheat.

Rice is a major crops of Kharif season in which irrigation is required in larger quantity that is available in India during this season through the monsoon. A continuous rain throughout the season also maintains the temperature fluctuations. Therefore, climate change is supposed to have more effect on crops during the season not only through changes in quantity and pattern of precipitation but also from changes in temperature.

Coping options for small holders

- Diversifying the livelihood sources
- Changing cropping patterns
- Planting more drought tolerant crops
- Increased share of non-agricultural activities
- Increased Agro-forestry practices
- Increased traditional coping strategies
- Improved on - farm soil & water conservation
- Change to a mixed cropping pattern
- Access to information