

(PROFORMA FOR SUBMISSION OF FINAL REPORT OF RESEARCH PROJECTS)**Part - I : General Information****800 Project Code:**

8001 Institute Project Code No: 59/3

8002 ICAR Project Code No:

801 Name of the Institute and Division: NAARM Education Division

8011 Name & Address of the Institute: National Academy of Agricultural Research Management, Rajendranagar, Hyderabad – 500 030

8012 Name of the Division/Section: XSM Division

8013 Location of the Project: NAARM, Rajendranagar, Hyderabad

802 Project Title: Technology Delivery Models for Less Favoured Areas**803 Priority Area: Applied Research (01)**8031 Research Approach: Applied Res./Basic Res./Process or Tech./Transfer of
Develop Technology
01 02 03 04804 **Specific Area:** Policy studies for promoting research on sustainable rural livelihoods under the L&CB Sub-project of NAIP805 **Duration of the Project:** 5 Years + 1 Years on extension

8051 Date of Start: April 01, 2008

8052 Date of Completion: March 31, 2014

806 **Total Cost/Expenditure Incurred: ~ 25 Lakhs**
(Give reasons for variation, if any, from the original estimated cost)**807 Executive Summary:**

Keeping in view the specificities (in terms of demographic, socio-economic, agro-ecological and livelihood parameters) of the less favoured areas (150 difficult districts identified by Planning Commission), the study based on desk-research, field observations and survey aims to document and analyze alternative models for effective technology delivery.

The observations and findings point to the following as the potential options for promoting technology delivery in less favoured areas:

- Effective technology delivery is a complex process as it involves
 - Technological considerations
 - Agro-ecological considerations
 - Socio-economic considerations
 - Market and infrastructure considerations
 - Policy considerations
- Analysis of existing models revealed
 - no single model can suit the specificities of the less favoured areas
 - pluralistic approach with appropriate models is the feasible option.
- Organizing producers and linking them to market is the critical issue to be addressed.
- KVKs, NGO-led, Producer-led, Market-led, ICT-led, and ATMA are **major preferred agencies** and demonstrations, farm schools, training, exposure visits and melas may be the preferred **strategies for technology delivery**.
- **Producer Company** and **ACABC** models need more detailed study as feasible models for less favoured areas besides **KVKs** and **ICT-led** initiatives.
- Social and market issues need focused attention
- Participatory technology development is a feasible option
- There is need to shift focus from technology delivery to 'technology uptake / use'
- Users' preferences need due consideration.

The following conclusions are drawn based on the observations and findings of the study:

- Promotion of pluralistic extension with focus on convergence
- Technology has to be 'bundled with other support services' for effective uptake
- Social engineering (institutional innovation) is a crucial driver, but difficult to sustain
- Innovative models at micro, meso and macro levels imply
 - Comprehensive synthesis to generate 'Good Extension Practices' for scaling up
 - Promote 'technology delivery' in project mode
- Enhance partnerships to achieve efficiency and effectiveness

808 Key Words: Technology, Technology Delivery, Technology Delivery Models, Less Favoured Areas

Part - II Investigator Profile

810 Principal Investigator:

8101 Name: Dr. B. S. Sontakki
8102 Designation: Principal Scientist
8103 Division/Section: Extension Systems Management (XSM) Division
8104 Location: NAARM, Rajendranagar, Hyderabad
8105 Institute Address: NAARM, Rajendranagar , Hyderabad – 500 030

811 Co-investigator:

8111 Name: Dr R. Venkattakumar
8112 Designation: Principal Scientist
8113 Division/Section: Extension Systems Management (XSM) Division
8114 Location: Rajendranagar, Hyderabad
8115 Institute Address: NAARM, Rajendranagar, Hyderabad – 500 030

Part - III: Technical Details

820 Introduction and objectives:

Less favoured areas are characterized by low production and productivity, degraded soils, harsh climates, low precipitation, poor water resources, improper management practices, and higher risks for production / enterprises like crops, horticulture, animal husbandry, poultry, etc. In rural areas, especially in agriculture, there are many partners to farmers /entrepreneurs like State Departments, ICAR Institutes, Voluntary Organizations, Agricultural Universities, Farmers Interest Groups, Commodity Boards, etc.

At present, there are a number of technology delivery models, which are to some extent efficient in transfer of technology in the rural areas like – KVK model, ATMA model, ATIC model, IVLP model, etc. to reach the farmers. Generally, more than one technology delivery model is used for different enterprises in various parts of the country. Successful models or integration of models may be thought off for different enterprises and need to be fine-tuned in less favoured areas. This project aimed to document technology delivery models that are in vogue in less favoured areas and evolve strategies for effective technology delivery models.

8201 Project Objectives:

Immediate Objectives

- To study selected less favoured districts in terms of their agro-ecology, farming/enterprises, demographic features, etc.

- To document technological delivery models in vogue with reference to their relevance and usefulness in less favoured areas
- To evolve appropriate technology delivery models and strategies for less favoured areas

Long term Objectives

- To evolve a policy and strategies for effective technology delivery in less favoured areas.

8202 Background Information and Importance of the Project:

Agricultural extension, or agricultural advisory services, comprises the entire set of organizations that support people engaged in agricultural production and facilitate their efforts to solve problems; link to markets and other players in the agricultural value chain; and obtain information, skills, and technologies to improve their livelihoods (Birner et al. 2009; Davis 2009). This definition has evolved since the T&V program, where the focus of extension was transfer of technology to improve productivity, especially for staple food crops. While transfer of technology still has relevance, agricultural extension is now seen as playing a wider role by developing human and social capital, enhancing skills and knowledge for production and processing, facilitating access to markets and trade, organizing farmers and producer groups, and working with farmers toward sustainable natural resource management practices (Swanson, 2008). Within this expanded role, the breadth of information that agricultural extension can support through provision and facilitating access and sharing is much larger. In addition, as the agriculture scenario has become more complex, farmers' access to sources of reliable and relevant information has become increasingly important. Farmers require a diverse range of information to support their farm enterprises. Information is needed not only on best practices and technologies for crop production, which the traditional public-sector extension system provided during the Green Revolution, but also information about postharvest aspects including processing, marketing, storage, and handling. Farmers require information related to the following (Van den Ban 1998):

- Most appropriate technological options
- Management of technologies, including optimal use of inputs
- Changing farm system options (mixed farming and diversification, animal husbandry, fisheries)
- Sourcing reputable input suppliers
- Collective action with other farmers
- Consumer and market demands for products
- Quality specifications for produce
- Time to buy inputs and sell produce
- Off-farm income generation options
- Implications of changing policies (input subsidies, trade liberalization)
- Access to credit and loans
- Sustainable natural resource management and coping with climate change

The information required will differ between categories of farmers and can be targeted to specific groups, based, for example, on landholding size or agro-climatic region (Rivera 1996). In addition to needing different types of information and using different information sources, different farmers will have different search behaviors. Factors such as literacy or access to resources will have a large impact on information needs, searching behavior, access, and use. Swanson (2008) described various target groups: rural and farm women, small and marginal subsistence farmers, medium-scale farmers, commercial farmers, and rural youth. In India, for example, the information needs of the 360 million farmers (expected to rise to 600 million by 2020) who operate under rainfed conditions and contribute 45 percent of production will be different from the needs of farmers in well endowed irrigated areas (Farrington, Sulaiman, and Pal 1997; Sulaiman and Holt 2002). In most rainfed areas, due to higher temporal and spatial variability in rainfall, nutrient poor soil, and poor socioeconomic conditions, many farmers are not able to produce beyond the quantity needed for self-consumption.

Less favoured areas as classified by the Planning Commission, Government of India pertain to 150 districts with harsh agro-ecological conditions and equally challenging socio-cultural features. These areas are also referred to as disadvantaged regions because of the inherent difficulties arising out of their unique and difficult agro-ecological, socio-cultural and demographic features. Chambers (1990) and many other researchers also have references to such areas as Complex, Diverse and Risk Prone (CDR). The distinctly unique features of these areas necessitate appropriate technology delivery models again distinctly different from the models in vogue in other situations. Hence, this study was taken up to suggest measures to evolve technology delivery models suited to the distinct agro-ecological, demographic, socio-political and economic features of less favoured areas.

821 Project Technical Profile:

8211 Technical Programme: (Indicate briefly plan of procedure, techniques, instruments and special materials, organisms, special environments, etc.)

a) Organization of Work Elements (For each objective and participating Investigator giving man-months involved):

Objective	Investigator	Man-months during years					
		2008-09	2009-10	2010-11	2011-12	2012-13	2013-14
➤ To study selected less favoured districts in terms of their agro-ecology, farming/enterprises, demographic features, etc.	BSS	2	2	-	-	-	-
	CS	1	-	-	-	-	-
	RVK	-	-	-	1	-	-

➤ To document technological delivery models in vogue with reference to their relevance and usefulness in less favoured areas	BSS	1	1	2	2	1	-
	CS	1	1	-	-		-
	RVK	-	-	-	2	2	-
➤ To evolve appropriate technology delivery models and strategies for less favoured areas	BSS	-	-	2	2	2	2
	RVK			-	2	2	2

Estimated Man-months (Year-wise for the team members):

#	Name of the team member (abbreviation)	Year-wise break-up of Man-months						Total Man-months
		I (2008-09)	II (2009-10)	III (2010-11)	IV (2011-12)	V (2012-13)	VI (2013-14)	
1.	B.S. Sontakki (BSS)	3	3	4	4	3	2	19
2.	C. Sriram (CS)	2	1	-	-	-	-	3
3.	R. Venkattakumar (RVK)	-	-	-	4	4	2	10

b) Organization of Work Elements (Year-wise break-up of activities, team members responsible and measurable outputs):

Year	Activities	Team Members	Measurable Outputs
2008-09	Desk study of less favoured (disadvantaged) districts	BSS & CS	Document on profile of disadvantaged districts
2009-10	Field observations and desk study on technology delivery status in less favoured (disadvantaged) districts	BSS & CS	Technology delivery and adoption status in sample less favoured (disadvantaged) districts (4)
2010-11	Field observations on technology delivery models in less favoured (disadvantaged) districts	BSS	Profile of technology delivery models in less favoured (disadvantaged) districts (4)
	Organize a national workshop	BSS	Workshop proceedings and recommendations
2011-12	Profile study of emerging and evolving models less favoured (disadvantaged) districts (ACABC and Producer Companies)	BSS & RVK	Report on Status of ACABC and PC Models
2012-13	Primary data collection from farmers to know their preferences on technology delivery options	BSS & RVK	Background paper, Proceedings and Recommendations.

	Consolidation and final report preparation	BSS & RVK	Project report.
2013-14	Primary data collection from farmers to know their preferences on technology delivery options	BSS & RV	Report on the field survey
	Policy communication by organizing a research workshop	BSS & RVK	Background paper, Proceedings and Recommendations.
	Consolidation and final report preparation	BSS & RVK	Project report.

8211.1 Methodology: The study was conducted largely by desk study methods and appropriate field studies like stakeholder consultations, brainstorming workshops, focused group discussions, and surveys. The study covered one district each under the 13 clusters listed by NAIP brochure on component 3. Further, case study approach was employed to document necessary observable indicators.

8211.2 Plan of action

#	Activity	Duration (Months)	Year	Remarks
1.	Conceptual framework for the study	2	2008-09	Literature survey and peer group discussions
2.	Desk study of less favoured (disadvantaged) districts	3	2008-09	--
3.	Field observations and desk study on technology delivery status in less favoured (disadvantaged) districts	3	2009-10	Field visits and observations; stakeholder consultations; focus group discussions
4.	Field observations and desk study on technology delivery status in less favoured (disadvantaged) districts	2	2010-11	Field visits and observations; stakeholder consultations; focus group discussions
5.	Organize a national workshop	2	2010-11	Workshop proceedings and recommendations
6.	Profile study of emerging models for less favoured (disadvantaged) districts (ACABC and Producer Companies)	4	2011-12	Report on Status of ACABC and PC Models
7	Primary data collection from farmers to know their preferences on technology delivery options	1	2013-14	Report on field survey
8	Policy communication by organizing a research workshop	1	2013-14	Workshop report
9	Consolidation and final report preparation	1	2013-14	Final report

8211.3 Time Schedule of Activities (Milestones): As indicated in table above

8212 Total Man-months Involvement of Component Project Workers:

- a. Scientific: PI – 17 man-months,
Co-I 1 – 3 man-month and
Co-I 2 – 8 man-months

- b. Technical: Nil
c. Supporting: Nil

822 Final Report on the Project: (Detailed report containing all relevant data with a summary of results (Not exceeding 2-5 pages)

8221 Achievements in Terms of Targets Fixed for Each Activity:

Targets	Achievements
Conceptual framework for the study	Achieved 100%. Conceptual framework developed and annexed to final report
Desk study of less favoured (disadvantaged) districts	Achieved 100%. Details presented in final report
Field observations and desk study on technology delivery status in less favoured (disadvantaged) districts	Achieved 100%. Details presented in final report
Field observations and desk study on technology delivery status in less favoured (disadvantaged) districts	Achieved 100%. Details presented in final report
Organize a national workshop	Achieved 100%. Details presented in final report
Profile study of emerging models for less favoured (disadvantaged) districts (ACABC and Producer Companies)	Achieved 100%. Details presented in final report
Policy communication by organizing a research workshop	Achieved 100%. Details presented in final report.
Consolidation and final report preparation	Achieved 100%. Report annexed.

8222 Questions - Answered:

1. What are the unique features of less favoured areas in terms of promoting and hindering technology delivery in agriculture?

Less favoured areas (referred to as disadvantaged districts in NAIP context) are characterized by harsh agro-climatic conditions, poor resource endowments and socio-economically weak population. Farming, though is a major livelihood option, is a high risk proposition due to more of abiotic stresses. These areas are also characterized by low technology uptake. Public, private and people-led models of technology delivery are in vogue but each model has its own limitations. Major factors that hinder technology use in these areas are:

- Lack of appropriate technology specifically adapted to these regions,
- Lack of access to technology due to factors of reach and cost
- Poor socio-economic status of farmers
- Recurrent draughts and erratic precipitation (either excess or less)

Amidst a host of problems these areas also promise few things that turn out to be facilitators of technology uptake and use. Presence of pluralistic systems for technology delivery promise good options for collaborative efforts. Participatory

approaches have demonstrated lot of potential in enhancing the social capital and thereby can enhance technology uptake for both farm and non-farm based livelihood options.

2. What are the relevant and useful technology delivery models for less favoured areas?

KVKs, NGO-led, Producer-led, Market-led, ICT-led, ATMA and Consortium models are the relevant and useful technology delivery models for less favoured areas.

3. What are the necessary pre-conditions for effective technology delivery in less favoured areas?

The observations and findings point to the following as the potential options for promoting technology delivery in less favoured areas:

- Effective technology delivery is a complex process as it involves
 - Technological considerations
 - Agro-ecological considerations
 - Socio-economic considerations
 - Market and infrastructure considerations
 - Policy considerations
 - Analysis of existing models revealed
 - no single model can suit the specificities of the less favoured areas
 - pluralistic approach with appropriate models is the feasible option.
- Organizing producers and linking them to market is the critical issue to be addressed.
- KVKs, NGO-led, Producer-led, Market-led, ICT-led, and ATMA are **major preferred agencies** and demonstrations, farm schools, training, exposure visits and melas may be the preferred **strategies for technology delivery**.
- **Producer Company** and **ACABC** models need more detailed study as feasible models for less favoured areas besides **KVKs** and **ICT-led** initiatives.
- Social and market issues need focused attention
- Participatory technology development is a feasible option
- There is need to shift focus from technology delivery to 'technology uptake / use'
- Users' preferences need due consideration

8223 Process/Product/Technology/Developed:

- ❖ Methodology for identifying the critical success factors of producer companies, agri-preneures and other such models

8224 Practical Utility (Not more than 150 words):

Linking producers to market for better livelihood is the key learning from the analysis. The emerging models imply enhanced role for researchers and extension personnel in terms of demonstrating the potential of technologies under users' conditions and social mobilization of producers' into viable and self-reliant groups, respectively. Following measures are suggested for strengthening technology delivery in less favoured areas:

- Promotion of pluralistic extension with focus on convergence
- Technology has to be 'bundled with other support services' for effective up-take
- Social engineering (institutional innovation) is a crucial driver, but difficult to sustain
- Innovative models at micro, meso and macro levels imply
 - Comprehensive synthesis to generate 'Good Extension Practices' for scaling up
 - Promote 'technology delivery' in project mode
- Enhance partnerships to achieve efficiency and effectiveness

8225 Constraints, if any:

None

823 Publications and Material Development:
(One copy each to be supplied with this Proforma)

8231 Research Papers: 10

1. Rana A., Nanda S.K., and Sontakki, BS. 2013. Barriers to Innovation in Public Sector R&D Organizations: Can Quality Management of Innovations Mitigate their Effects?, *International Journal of Business and Economic Research (IJBER)* 1 (1), 43-61.
2. Rana A, G.P. Reddy and B. S. Sontakki. 2013. Perceived Service Quality of Agricultural Organizations: Comparative Analysis of Public and Private Sector. *International Journal of Advanced Research in Management and Social Sciences* (ISSN: 2278-6236). 2 (1): 286-295.
3. Venkattakumar R, P. Chandrashekara and B. S. Sontakki. 2013. Challenges in Establishing Agribusiness Ventures in India. *Journal of Agricultural Extension Management*. 1: 23-30.
4. Meti CB, Bharat S. Sontakki, L. M. Ahire. 2013. Kisan Call Centres- A One Stop Destination for Farmers to Acquire Solutions to their all Agricultural Problems. *Journal of Communication Studies*. 31: 3-19.
5. Venkattakumar R, BS Sontakki, Rasheed Sulaiman and N. Sriram. (2013) Success stories on 'Producer Company' model in Andhra Pradesh. *Journal of Extension Education*, 23 (3): 4658-4662.

6. Venkattakumar R, BS Sontakki, Rasheed Sulaiman and N. Sriram. 2012. Success stories on 'Producer Company' model in Andhra Pradesh. *Journal of Extension Education*. 23 (3): 4658-4662.
7. Venkattakumar R and BS Sontakki. (2012) Producer Companies in India- Experiences and Implications. *Indian Research Journal of Extension Education*. 1 (Special Issue): 154-160.
8. Rana.A.S, Nanda.S.K, Sontakki.B.S, 2011. Innovation Quality Management in agricultural R & D organizations- mapping innovation quality and performance, *Asian Journal of Management Research*, 1(2):629- 43.
9. Rana.A.S, Nanda.S.K, Sontakki.B.S, 2011. Innovation quality management in public sector research and development organizations: application of six sigma methodology, *International Journal of Management Science, and Engineering Management*, 6(4): 307-312,
10. Ahire LM, B. S. Sontakki and P. Punna Rao. 2009. Performance of Agri-clinics and Agri-business Centres in Maharashtra. *Agricultural Extension Review* (July-September):3-13

8232 Popular Articles: Nil

8233 Reports: 3

- i) Sontakki, B. S., Samanta, R. K., and Joshi, P. K. 2010. *Redesigning agricultural extension in India: Challenges and opportunities*. Compendium of Papers presented during NAARM-IFPRI workshop held on 20-21 August 2010. NAARM, Hyderabad, India, 24 pp
- ii) R. Venkattakumar and B. S. Sontakki. (2012). Institutional innovations in Agri-Extension for Inclusive Growth. Report of the Training Workshop. NAARM, Hyderabad.
- iii) R. Venkattakumar and B. S. Sontakki. (2014). Institutional innovations in Agri-Extension for Inclusive Growth . Report of the Training Workshop. NAARM, Hyderabad.

824 Seminars, Conferences and Workshops (Relevant to the Project) in which the Scientists have participated: 4
(List abstracts forwarded)

824 **Infrastructural Facilities Developed:**
(Details of field, laboratory, notebooks and final material and their location)
A Base Paper and a Project-cum-Workshop Report developed as reported above.

825 Comments/Suggestions of Project Leader regarding possible future line of work that may be taken up arising out of this Project:: An institutional research project has been proposed and approved on **Impact of 'Producer Companies' in Fostering Community Entrepreneurship** .

**Part - IV: Project Expenditure
(Summary)**

Year 2008-14

830 Total Recurring Expenditure:

8301 Salaries: (Designation with pay scale)

i) Scientific		
ii) Technical	Nil	Nil
iii) Supporting	Nil	Nil
iv) Wages	Nil	Nil
Sub_total salaries		

8302 Consumables:

i) Chemicals	Nil	Nil
ii) Glassware	Nil	Nil
iii) Others (Questionnaire and Report)	25,000=00	25,000=00
Sub-total	25,000=00	25,000=00

8303 Travel: 1,50,000=00 1,50,000=00

8304 Miscellaneous: (Other costs) 25,000=00 25,000=00

8305 Sub-total (Recurring) 2,00,000=00 2,00,000=00

8306 Workshops 13,50,000=00 13,50,000=00

831 Non-recurring Expenditure: Nil Nil
(Equipment and works)

832 Total 2,00,000=00 2,00,000=00

232 (a) Workshop and Brainstorming Session: ` 13.5 lakhs (approx..)

Total

Part - V: DECLARATION

This is to certify that the final report of the Project has been submitted in full consultation with the Project Workers as per the approved objectives and technical programme and the relevant records, notebooks and materials are available for the same.

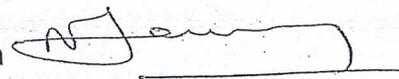
Signature of the Project Investigator (B. S. Sontakki):



Signature of the Co-investigator: R. Venkattakumar

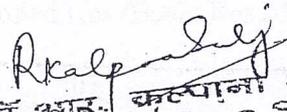


Signature & Comments of the Head of the Division/Section

Forwarded


Work completed. Project closed.

Signature & Comments of the Joint Director


कल्पना शास्त्री
Dr. R. Kalpana Sastry
संयुक्त निदेशक/Joint Director
राष्ट्रीय कृषि अनुसंधान प्रबंध अकादमी
National Academy of Agricultural Research Management
राजेन्द्रनगर/Rajendranagar, हैदराबाद/Hyderabad-500 030.

Signature & Comments of the Director