PG Degree Programme Syllabus as per BSMA,
ICAR M.Sc. (Agri.) Agricultural Extension Education

M.S. Swaminathan School of Agriculture
Centurion University of Technology and Management
Alluri Nagar, P.O. - R Sitapur, Via- Uppalada, Paralakhemundi
Dist: Gajapati – 761211
Odisha,
India 2025

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Preamble

The curricula development is a part of the continued process and effort of the ICAR in this direction for dynamic improvement of national agricultural education system. In this resolve, the ICAR has constituted a National Core Group (NCG) for restructuring of Master‘s and Ph.D. curriculum, syllabi and academic regulations for the disciplines under agricultural sciences. On the recommendations of the NCG, 19 Broad Subject Matter Area (BSMA) Committees have been constituted by the ICAR for revising the syllabus. These Committees held discussions at length in the meetings and workshops organized across the country. The opinions and suggestions invited from institutions, eminent scientists and other stakeholders were also reviewed by the Committees. The respective BSMA Committees have examined the existing syllabus and analysed carefully in terms of content, relevance and pattern and then synthesized the new syllabus.

The revised curriculum of 79 disciplines has been designed with a view to improve the existing syllabus and to make it more contextual and pertinent to cater the needs of students in terms of global competitiveness and employability. To mitigate the concerns related to agriculture education system in India and to ensure uniform system of education, several changes have been incorporated in common academic regulations in relation to credit load requirement and its distribution, system of examination, internship during Masters programme, provision to enroll for online courses and take the advantage of e-resources through e-learning and teaching assistantship for Ph.D. scholars. As per recommendations of the National Education Policy-2020, the courses have been categorized as Major and Minor/Optional courses. By following the spirit of Choice Based Credit System (CBCS), thestudents are given opportunity to select courses from any discipline/department enabling the multi-disciplinary approach.

We place on record our profound gratitude to Dr Trilochan Mohapatra, Director General, ICAR, New Delhi, for providing an opportunity to revise the syllabi for PG and Ph.D. programs in agriculture and allied sciences. The Committee is deeply indebted to Dr R.C. Agrawal, DDG (Agri. Edn), and to his predecessor Dr N.S. Rathore for their vision and continuous support. Our thanks are due to all Hon‘ble Vice Chancellors of CAUs/SAUs/ DUs for their unstinted support and to nominate the senior faculty from their universities institutes to the workshops organized as a part of wider consultation process. The revised syllabi encompass transformative changes by updating, augmenting, and revising course curricula and common academic regulations to achieve necessary quality and need-based agricultural education. Many existing courses were upgraded with addition and deletion as per the need of the present situation. The new courses have been incorporated based on their importance and need both at national and international level. We earnestly hope that this document will meet the needs and motivate different stakeholders.

Content

Framework of the courses

The following nomenclature and Credit Hrs. need to be followed while providing thesyllabus for all the disciplines

Courses	M.Sc. (Agri.) Credits
Major Courses	20
Minor Courses	08
Supporting Courses	06
Common Courses	05
Seminar	01
Thesis	30
Total	70

M. Sc. Agricultural Extension Education Course Structure- at a Glance

Course Code	Course Title	Credit	Page No.
Major Courses			
EXTN 0501*	Extension Landscape	2+0	7
EXTN 0502*	Applied Behaviour Change	2+1	11
EXTN 0503*	Organisational Behaviour and Development	2+1	14
EXTN 0504*	Research Methodology in Extension	2+1	16
EXTN 0505*	Capacity Development	2+1	20
EXTN 0506*	ICTs for Agricultural EXtension and Advisory Services	2+1	24
EXTN 0507*	Evaluation and Impact Assessment	2+1	27
EXTN 0591	Master‘s Seminar	0+1	
EXTN 0592	Thesis/Research	30	
Minor Courses			
EXTN 0508	Managing Extension Organizations	2+1	33
EXTN 0509	Enabling Innovation	1+1	35
ABMN 0511	Rural Marketing	3+0	39
EXTN 0510	Gender Mainstreaming	2+1	40
Supporting Courses			

STAT 0502	Statistical Methods for Applied/ Social Sciences	2+1	44
EXTN 0541	Computer Applications for Agricultural EXtension Research	2+1	45

Common Courses			
PGSS 0501	Library and Information Services	0+1	47
PGSS 0502	Technical Writing and Communications Skills	0+1	48
PGSS 0503	Intellectual Property and its Management in Agriculture	1+0	48
PGSS 0504	Basic Concepts in Laboratory Techniques	0+1	49
PGSS 0505	Agricultural Research, Research Ethics and Rural Development Programmes	1+0	50

*** Indicates core course which is compulsory course for M.Sc. (Agri)**

M.Sc. (Agri.) in Agricultural Extension Education

Syllabus MAJOR COURSE

Couse Code: EXTN
0501 Credit Hours: 2+0
Course Title: Extension Landscape

Objectives

1. To make the students aware of new challenges before the extension and how the extension is evolving globally.
2. To orient students to the new insights from communication and innovation studies.
3. To familiarize the students with the impact of extension reforms, the new approaches and the policy challenges in managing a pluralistic extension system.

At the end of the course the students will be able to achieve the following outcomes:

Course Outcomes

CO1: Understand extension and advisory services (EAS).

CO2: Acquire knowledge on new approaches, new funding, and delivery models that emerged in response to reforms implemented in several countries.

CO3: Develop interest in strengthening pluralistic EAS and enhancing its contribution towards developing an effective Agricultural Innovation System (AIS).

CO4: Gain knowledge on how extension is shaped globally and the policy level challenges it faces.

CO5: Acquaint with problem-solving skills to address real-world challenges farmers and rural communities face.

CO-PSO Mapping:

	PSO1	PSO2	PSO3
CO1	✔		
CO2	✔	✔	
CO3		✔	✔
CO4	✔		
CO5		✔	✔

Theor

y

UNIT

I

Extension and Advisory Services (EAS)- Meaning (embracing pluralism and new functions) New Challenges before farmers and extension professionals: Natural Resource Management- Supporting farmers to manage the declining/deteriorating water and soil for farming; Gender Mainstreaming- How extension can enhance access to new knowledge among women farmers; Nutrition- Role of extension in supporting communities with growing nutritious crop and eating healthy food; Linking farmers to markets- Value chain extension including organizing farmers, strengthen value chain and supporting farmers to respond to new standards an

regulations in agri-food systems; Adaptation to climate changes-How extension can contribute to up-scaling Climate Smart Agriculture; Supporting family farms- strengthening the capacities of family farms; Migration-Advising farmers to better respond to opportunities that emerge from increasing mobility and also supporting migrants in enhancing their knowledge and skills; Attracting and Retaining Youth in Agriculture including promotion of agri- preneurship and agri-tourism; Urban and peri-urban farming- How to support and address issues associated with urban and peri-urban agriculture; Farmer distress, suicides- Supporting farmers in tackling farm distress.

UNIT II

Beyond transfer of technology: Performing new functions to deal with new challenges; Organizing producers into groups-dealing with problems that need collective decision making such as Natural Resource Management (NRM) and access to markets; Mediating conflicts and building consensus to strengthen collective decision making; Facilitating access to credit, inputs and services-including development of service providers; Influencing policies to promote new knowledge at a scale Networking and partnership development including convening multi-stakeholder platforms/ innovation platforms. New Capacities needed by extension and advisory services at different levels –at the individual (lower, middle

management and senior management levels), organizational and enabling environment levels; –Core competencies at the individual level; Varied mechanisms for capacity development (beyond training).

UNIT III

Pluralism in Extension Delivery: Role of private sector (input firms, agri-business companies, consultant firms and individual consultants)- Trends in the development of private extension and advisory services in India and other countries; challenges faced by private extension providers; Role of Non-Governmental Organizations (National/international)/ Civil Society Organizations (CSOs) in providing extension- Experiences from India and other countries; Producer Organizations- Role in strengthening demand and supply of extension services; their strength and Social Sciences: Agricultural Extension Education weaknesses-experiences from different sectors; Role of Media and ICT advisory service providers; global experiences with use of media and ICTs in advisory services provision

UNIT IV

Diffusion of Innovations paradigm- strengths and limitations; multiple sources of innovation-farmer innovation, institutional innovation; farmer participation in technology generation and promotion; strength and limitations; Agricultural Knowledge and Information Systems (AKIS); strength and limitations; Agricultural Innovation Systems (AIS); Redefining Innovation- Role of extension and Advisory Services in AIS-From information delivery to intermediation across multiple nodes; Role of brokering; Innovation Platforms, Innovation Management; Strength and weaknesses of AIS. Rethinking Communication in the Innovation Process – Network building, support social learning, dealing with dynamics of power and conflict.

UNIT V

Evolution and features of extension approaches: Transfer of technology approach; educational approach, farmer participatory extension approach, demand-driven extension, market led extension (value chain extension), extension for climate smart agriculture, gender sensitive extension, extension for entrepreneurship Extension systems in different regions: Asia-Pacific, Europe, Latin America, Australia, North America Networking for Strengthening EAS: GFRAS (Global Forum for Rural Advisory Services) and its regional networks.

UNIT VI

Reduction in public funding: public withdrawal from extension provision (partial/ full); Examples/Cases; Privatization: Public funding and private delivery; cost sharing and cost recovery; Examples/Cases; Decentralization of extension services; examples/ Cases; Lessons from extension reforms in different countries; Extension and Sustainable Development Goals (SDGs).

UNIT VII

Pluralism: Managing pluralism and Co-ordination of pluralistic extension provision; Public private partnerships in extension (including the role of local governments/ panchayats and producer organizations); examples, challenges in co-ordination; Achieving convergence in extension planning and delivery, Financing extension Mobilizing resources for extension: public investments, donor support (grants/loans); Monitoring and Evaluation of extension: Generating appropriate data for Assessment and Evaluation of pluralistic
extension; Strengthening extension policy interface; generating evidence on impact of extension and policy relevant communication.

Suggested Reading

Adolph B. 2011. Rural Advisory Services Worldwide: A Synthesis of Actors and Issues.

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Bentley J, Chowdhury A and David S. 2015. Videos for Agricultural Extension. Note 6. GFRAS Good Practice Notes for Extension and Advisory Services. GFRAS: Lindau, Switzerland. https://www.g-fras.org/en/good-practice-notes/6-video-for-agricultural-extension.html

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David S. 2018. Migration and rural advisory services. GFRAS Issues Paper 2. Global Forum for Rural Advisory Services. https://www.g-fras.org/en/knowledge/gfras-publications/category/97-gfras-issues-papers
Davis K and Heemskerk W. 2012. Coordination and Collective Action for Agricultural Innovation Overview Module 1 Investment in Extension and Advisory Services as Part of Agricultural Innovation Systems. In Agricultural Innovation Systems: An Investment Sourcebook. Agricultural and Rural Development. World Bank.. http://siteresources.worldbank.org/INTARD/Resources/335807-1330620492317/9780821386842ch3.pdf
Faure G, Pautrizel L, de Romémont A, Toillier A, Odru M and Havard M. 2015. Management Advice for Family Farms to Strengthen Entrepreneurial Skills. Note 8. GFRAS Good Practice Notes for Extension and Advisory Services. GFRAS: Lindau, Switzerland. https://www.gfras.org
Effective Strategies in support of Smallholder Farmers. Technical Centre for Agricultural and Rural Cooperation (CTA) and Wageningen University and Research (WUR)/ Convergence of Sciences Strengthening Innovation Systems (CoS-SIS), Wageningen. https://publications.cta.int/media/publications/downloads/1829_PDF.pdf
Leeuwis C with A W van den Ban. 2004. Communication for rural innovation: Rethinking agricultural extension. John Wiley & Sons.
Magdalena B. and Sanne C. 2016. Innovative Financing Mechanisms for Demand- driven Agricultural Advisory Services. GFRAS good practice note for extension and advisory services 21. Global Forum for Rural Advisory Services. https://www.g-fras.org/en/good-practice-notes/20-innovative-financing-mechanisms.html#SNote8
Manfre C, Rubin D and Nordehn C. 2017. Assessing How Agricultural Technologies can Change Gender Dynamics and Food Security Outcomes. A three-part toolkit. Integrating Gender and Nutrition within Agricultural Extension Services (INGENAES). http://
www.culturalpractice.com/wp-content/uploads/Introduction-to-the-Toolkit-Final-10_17.pdf
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Advisory Services: A Guide for Facilitators. Agricultural Extension in South Asia (AESA). http://crispindia.org/wpcontent/uploads/2015/09/Facilitators-Guide-Final-LR.pdf

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Swanson BE and Rajalahti R. 2010. Strengthening Agricultural Extension and Advisory Systems: Procedures for Assessing. Transforming, and Evaluating Extension Systems. Agriculture and Rural Development Discussion Paper; No. 45. World Bank, Washington, DC. http://siteresources.worldbank.org/INTARD/Resources/Stren_combined_web.pdf
Swanson BE. 2008. Global Review of Good Agricultural Extension and Advisory Service Practices. Food and Agriculture Organization of the United Nations. Rome. FAOpdf
Terblanche S and H Ngwenya. 2017. Professionalisation of Rural Advisory Services. Note 27.

Suggested Website

AESA- Agricultural Extension in South Asia http://www.aesanetwork.org

FAO- Food and Agricultural Organisation (Research and Extension) http://www.fao.org

GFRAS- Global Forum for Rural Advisory Services http://www.g-fras.org/en
INGENEAS- Integrating Gender and Nutrition within Agricultural Extension Services https://ingenaes.illinois.edu/
IFPRI- International Food Policy Research Institute (Extension) http://www.ifpri.org/topic
KIT- Royal Tropical Institute (KIT)- Sustainable Economic Development https://www.kit.nl/sed/
WUR- Wageningen University and Research (Knowledge, Technology and Innovation Group (KTI)) https://www.wur.nl/en

Couse Code: EXTN
0502 Credit Hours: 2+1
Course Title: Applied Behaviour Change

Objectives

1. To develop a deep understanding of human behaviour.
2. To familiarize students with behaviour change theories and models,
3. To cultivate leadership and facilitation skills that enable students to effectively lead and coordinate behaviour change initiatives.

At the end of the course the students will be able to achieve the following outcomes:

Course Outcomes

CO1: Gain a comprehensive understanding of human behaviour.

CO2: Become familiar with various behaviour change theories and models.

CO3: Develop strong communication skills.

CO4: Understand cultural sensitivity and an appreciation for the diversity of cultural norms and values.

CO5: Acquire knowledge on behaviour change interventions with ethical considerations.

CO-PSO Mapping:

	PSO1	PSO2	PSO3
CO1			✔
CO2		✔	
CO3		✔	✔
CO4	✔	✔	
CO5			

Theor
y
UNIT
I

Foundations of Human Behaviour: Human behaviour – Meaning, importance and factors influencing human behaviour; Biological bases of human behaviour – Nervous system, brain, endocrine system and genes; Individual variations – intelligence, ability and creativity– foundations and theories, personality and temperament - foundations, approaches, theories of personality, measuring personality (traits, locus of control, self-efficacy; Personal, social and moral development – meaning, concepts – self-concept, self-esteem and self-worth and theories. Motivation – foundations, approaches, theories, managing human needs and motivations; perceiving others – impression, attitude, opinions; Emotions - foundations, types and functions, measuring emotional intelligence

UNIT II

Cognitive Processes affecting Human Behaviour: Sensory organs and their role cognition; Cognitive processes – Attention, perception, remembering and forgetting, knowledge and expertise – foundations and theories; Principles and processes of perception; Consciousness – meaning, types, sleep and dreams; Learning and Memory – Memory - meaning, types and mechanisms of storage and retrieval of memories in the Human brain; Complex cognitive processes- Concept formation, Thinking, Problem solving and transfer – foundations, theories and approaches

UNIT III

Information processing – meaning, principles; Models of information processing - Waugh and Norman model of primary and secondary memory; Atkinson and Shiffrin‘s stage model of memory; other models including blooms taxonomy and Sternberg‘s Information Processing Approach; Attention and perception – meaning, types, theories and models; Consciousness.

UNIT IV

Learning – foundations, approaches and theories; Cognitive approaches of learning– meaning, principles theories and models; Memory – foundations, types; Behavioural approaches of learning – foundations and theories - classical conditioning, operant conditioning, applied behaviour analysis; Social cognitive and constructivist approaches to learning – foundations and theories – social cognitive theory, Self- regulated learning; learning styles – meaning, types and applications in learning.

UNIT V

Human Judgement – meaning, nature, randomness of situations, theories and models; Choice – meaning, criteria for evaluating options; theories and models of human choice; Choice architecture; Decision-making – Meaning, problem analysis; steps and techniques of decision-making under different contexts

UNIT VI

Attitudes and Influence: Attitudes - meaning, assumptions, types, theories and models of attitude formation; methods of changing attitudes, Relating to others - liking, attraction, helping behaviour, prejudice, discrimination and aggression; Liking/ affect – meaning, types and theories; Attraction – meaning, types and theories; Persuasion – meaning, theories and techniques; Social influence and groups – conformity, compliance and obedience.

UNIT VII

Social Judgement, Social Identity and Inter-Group Relations: Social judgement – meaning, frame of reference, stereotyping; The judgement of attitude models; Attribution – meaning, theories; Rational decision making; Social identify – meaning, types; assessment; Groups – meaning, types, group processes; sustainability of groups; Inter group processes and theories social learning.

Practical

- Understanding perception – Attentional Blink and Repetition Blindness exercise
- Understanding attention - Testing selective attention capacity and skills and processing speed ability through Stroop test
- Hands-on experience in the techniques for assessing creative thinking – divergent and convergent thinking
- Lab exercise in applying Maslow‘s need hierarchy to assess motivation
- Learning - Classical conditioning and operant conditioning
- Assessing learning styles through Barsch and Kolb inventories
- Practical experience in building self-esteem
- Assessment of emotional intelligence
- Exercises in problem solving
- Exercises in visual perception
- Measuring self-concept using psychometric tools
- Experiment on factors influencing information processing
- Assessment of attitudes
- Hands on experience in methods of persuasion
- Field experience in assessing social judgment
- Simulation exercise to understand decision-making under different situations
- Exercise in rational decision-making.

Suggested Reading

Eiser J, Richard. 2011. Social Psychology: Attitudes, Cognition and Social Behaviour. Cambridge: Cambridge University Press. (First Edition, 1986))

Eysenck MW and Keane M T. 2010. Cognitive psychology: A student‘s handbook. Sixth Edition, Hove: Psychology Press.

Feldman RS. 2008. Essentials of understanding psychology (7th ed.). Boston: McGraw-Hill.

Gilovich T, Keltner D, and Nisbett RE. 2011. Social psychology. New York: W.W. Norton & Co. Moreno R. 2010. Educational Psychology. Hoboken, NJ: John Wiley & Sons Inc.

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Thomas GC and Christopher GW. 2013. Organizational development and change, 10th edition, South-Western college publishing.

Wendell LF and Cecil HB. 1999. Organizational Development: Behavioural science interventions for organization improvement, Pearson. 368 pp.

Couse Code: EXTN
0503 Credit Hours: 2+1
Course Title: Organisational Behavior and Development

Objectives

1. To understand the theory and practice of organizational behaviour, development and change processes.
2. To develop insight and competence in diagnostic and intervention processes and skills for initiating and facilitating organisational change.
3. To gain necessary self-insight, skills in facilitation, organizational development (OD) skills.

At the end of the course the students will be able to achieve the following outcomes:

Course Outcomes

CO1: Understand the theory and practice of organizational behaviour, development and change processes.
CO2: Develop insight and competence in diagnostic and intervention processes and skills for initiating and facilitating organisational change.
CO3: Gain necessary self-insight, skills in facilitation, organizational development (OD) skills.
CO4: Learn several skills to become potential change agents and OD practitioners.
CO5: Acquire individual, group/team and organizational performance through OD techniques or interventions.

CO-PSO Mapping:

	PSO1	PSO2	PSO3
CO1	✔		✔
CO2	✔	✔	✔
CO3		✔	
CO4	✔	✔	✔
CO5		✔	✔

Theory
UNIT I

Basics of Organization: Introduction to organizations-concept and characteristics of organizations; Typology of organizations; Theories of organizations: nature of organizational theory, Classical theories, Modern management theories, System Theory - Criticisms and lessons learnt/ analysis

UNIT II

Basics of Organizational Behaviour: Concepts of Organisational Behaviour, Scope, Importance, Models of OB.

UNIT III

Individual Behaviour in Organizations: Introduction, Self-awareness, Perception and Attribution, Learning, Systems approach to studying organization needs and motives –

attitude, values and ethical behavior, Personality, Motivation-Concept & Theories, Managing motivation in organizations

UNIT IV

Group Behaviour in Organization: Foundations of group, group behaviour and group dynamics, Group Development and Cohesiveness, Group Performance and Decision Making, Inter-group Relations; Teams in Organizations-Team building experiential exercises, Interpersonal. Communication and Group; Leadership: Meaning, types, Theories and Perspectives on Effective Leadership, Power and Influence, managing Conflict and Negotiation skills, Job/ stress management, decision-making, problem-solving techniques.

UNIT V

Productive Behaviour and Occupational Stress: Productive behaviour - Meaning, dimension; Job analysis and Job performance – meaning, dimensions, determinants and measurement; Job satisfaction and organizational commitment - meaning, dimensions and measures roles and role clarity; Occupational stress – meaning, sources, theories and models, effects, coping mechanism, effects and management; Occupational stress in farming, farmer groups/ organizations, research and extension organizations.

UNIT VI

Organizations Structure- Need and Types, Line & staff, functional, committee, project structure organizations, centralization &decentralization, Different stages of growth and designing the organizational structure; Organizational Design- Parameters of Organizational Design, Organization and Environment, Organizational Strategy, Organization and Technology, Power and Conflicts in Organizations, Organizational Decision-Making; Organizational Culture vs. Climate; Organizational Change; Organizational Learning and Transformation.

UNIT VII

Overview of Organizational Development: Concept of OD, Importance and Characteristics, Objectives of OD, History and Evolution of OD, Implications of OD Values

UNIT VIII

Managing the Organizational Development Process: Basic Component of OD Program-Diagnosis-contracting and diagnosing the problem, Diagnostic models, open systems, individual level group level and organizational level diagnosis; Action-collection and analysis for diagnostic information, feeding back the diagnosed information and interventions; Program Management- entering OD relationship, contracting, diagnosis, feedback, planned change, intervention, evaluation.

UNIT IX

Organizational Development Interventions: Meaning, Importance, Characteristics of

Organization development Interventions, Classification of OD Interventions-Interpersonal interventions, Team Interventions, Structural Interventions, Comprehensive Interventions.

UNIT X

Organizational Development Practitioner or Consultant: Who is OD consultant? Types of OD consultants and their advantages, qualifications, Comparison of traditional consultants Vs. OD consultants, Organizational Development process by the practitioners‘ skills and activities.

Practical

- Case Analysis of organization in terms of process – attitudes and values, motivation, leadership.
- Simulation exercises on problem-solving – study of organizational climate in different organizations.
- Study of organizational structure of development departments, study of departmentalization, span of control, delegation of authority, decision-making patterns.
- Study of individual and group behaviour at work in an organization.
- Conflicts and their management in an organization.
- Comparative study of functional and nonfunctional organizations and drawing factors for organizational effectiveness.
- Exercise on OD interventions (Interpersonal, Team, Structural, Comprehensive) with its procedure to conduct in an organization

Suggested Reading

Bhattacharyya DK. 2011. Organizational Change and Development, Oxford University Press. Hellriegel D, Sloccum JW and Woodman. 2001. Organizational Behaviour. Cincinnati, Ohio:South-Western College Pub.
Luthans F. 2002. Organizational Behaviour. Tata McGraw-Hill, New York Newstrom JW and Davis K. 2002. Organizational Behaviour: Human behaviour at Work. Tata- McGraw Hill, New Delhi.
Peter MS. 1998. The Fifth Discipline: The Art and Practice of Learning Organization. Random House, London.
Pradip NK. 1992. Organizational Designs for Excellence. Tata McGraw Hill, New Delhi
Shukla, Madhukar. 1996. Understanding Organizations. Prentice Hall of India, New Delhi.
Stephens PR and Timothy AJ. 2006. Organizational Behaviour, 12th Edition. Prentice Hall

Couse Code: EXTN
0504 Credit Hours: 2+1
Course Title: Research Methodology in Extension

Objectives

1. To develop a clear understanding of the fundamental principles and concepts that

underlie research.

2. To impart knowledge on formulating research questions, hypotheses, and objectives.
3. To equip students with the foundational knowledge and practical skills required to engage in research effectively.

At the end of the course the students will be able to achieve the following outcomes:

Course Outcomes

CO1: Gain fundamental knowledge and critical competencies in planning, conducting and applying behavioural research.

CO2: Understand behavioural research concepts, paradigms, approaches, and strategies.

CO3: Choose research design, methods and tools suitable for the research problem.

CO4: Design research instruments skilfully and conduct research objectively and unbiasedly.

CO5: Analyse the data through appropriate analytical methods and tools and derive meaningful interpretations.

CO-PSO Mapping:

	PSO1	PSO2	PSO3
CO1			✔
CO2	✔		✔
CO3			✔
CO4			✔
CO5			✔

Theory

UNIT I

Nature of Behavioural Research: Methods of knowing; Science and scientific method; Behavioural research – Concept, aim, goals and objectives; Characteristics and Paradigms of research; Types of behavioural research based on applications, objectives and inquiry; Types of knowledge generated through research – historical, biological, theoretical and conceptual knowledge, prior research studies, reviews and academic debate; Role of behavioural research in extension; Careers in behavioural research.

UNIT II

The Behavioural Research Process:Basic steps in behavioural research – Formulating a Research Problem; Reviewing the Literature; Identifying the variables and hypotheses; Formulating research designs, methods and tools; Selecting sample; Collecting data;

Analyzing and Interpreting the Data; Reporting and Evaluating Research; Skills needed to design and conduct research; Writing research proposals.

UNIT III

Formulating a Research Problem: The research problem and research topic - definitions; Importance of formulating a research problem; Sources of research problems; Characteristics of a good research problem; Research problems in quantitative and qualitative research; Steps in formulating a research problem; Strategies for writing research problem statement; Research purpose statement; Research questions – Types, Criteria for selecting research questions, techniques for narrowing a problem into a research question; Objectives - Meaning, types and

criteria for judging the objectives.

UNIT IV

Reviewing the Literature: Review-meaning and importance; Types of literature review – Context, Historical, Integrative, methodological, self-study and theoretical; Literature review for quantitative and qualitative studies; Steps in conducting literature review – Identify key terms, locate literature, critical evaluation and selection; organising literature.

UNIT V

Identifying Variables and Hypotheses: Developing theoretical, conceptual, empirical frameworks; Approaches for identifying concepts, constructs and variables; Role of theory in behavioural research; Steps in identifying variables – Domain, Concepts, Constructs, Dimensions; Indicators; Variables, Definitions, premises, propositions and hypotheses; Techniques of identifying concepts, constructs and variables - Types of concepts; Types of variables–causal relationship, the study design; and the unit of measurement; Types of definitions-Types of propositions and hypotheses. Characteristics of good hypotheses; Measurement – Meaning, levels of measurement – nominal, ordinal, interval and ratio; Criteria for choosing measurement levels for variables.

UNIT VI

Formulating Research Designs, Methods and Tools: Research designs – Definition, purpose and functions; Research Design as Variance Control - MAXMINCON Principle; Criteria for selecting a suitable Research Design; Classification of research designs: Quantitative designs - experimental, descriptive, comparative, correlational, survey, ex-post-facto and secondary data analysis; Qualitative designs - ethnographic, grounded theory, phenomenological and Narrative research; Mixed method designs – Action research design; Translational research; Elements of research design - Research strategies, Extent of researcher interference, Study setting, Unit of analysis and Time horizon. Sources of errors while specifying research designs. Internal and external validity; Choosing right research design; Triangulation - Importance in behavioural research, Types of triangulations. Research methods: Designing research Instruments – questionnaires, interview schedules; tests – knowledge tests, behaviour performance tests; scales–scales and indexes, checklists, focus groups; Steps in developing and using research methods and tools; participatory rural appraisal.

UNIT VII

Sampling - population, element, sample, sampling unit, and subject; Sampling strategies for quantitative and qualitative research; Principles of sampling; Factors affecting the inferences drawn from a sample; Types of sampling, Methods of drawing a random sample, Sampling with or without replacement, Types of sampling- Probability Sampling - Simple random sampling, Cluster sampling, Systematic sampling, Stratified random sampling and Unequal probability Sampling; Non- probability Sampling - Reliance of available subjects, Purposive or judgmental sampling, accidental sampling, expert sampling, Snowball sampling, and Quota sampling; Sample size requirements for quantitative and qualitative studies. Methods for

estimating sample size; Generalisation – Importance, Types of generalisations.

UNIT VIII

Collecting Data:The process of collecting data – Selection, training, supervision, and evaluation of field investigators; Online data collection; Errors and biases during data collection. Testing goodness of measures through item analysis - Reliability and validity; Types of validity – Content validity: Face and content validity, Criterion-related validity: concurrent and predictive validity, Construct validity: convergent, and discriminant validity, factorial validity, and nomological validity; Types of reliability–Test-Retest, Parallel forms, Inter-item consistency reliability, Split-half reliability. Factors affecting the validity and reliability of research instruments, Strategies for enhancing validity and reliability of measures. Validity and reliability in qualitative research.

UNIT IX

Analyzing and Interpreting the Data: Data coding, exploration and editing; Methods of data processing in quantitative and qualitative studies; Quantitative data analysis - parametric and non-parametric statistical analyses; Parametric analysis – Descriptive and inferential statistics,

Hypothesis testing - Type I and Type II errors. Concepts in hypothesis testing - Effect Size, á, â, and Power, P Value; Multivariate data analysis – regression, factor analysis, cluster analysis, logistic regression and structural equation modelling. Guidelines for choosing appropriate statistical analysis; Statistical packages for data analysis; Methods of interpreting data and drawing inferences - The Ladder of Inference; Methods of communicating and displaying analysed data.

UNIT X

Reporting and Evaluating Research: Writing reports and research publications; Evaluation Methodology

Practical

- Selecting a research problem and writing problem statement
- Narrowing down research problem to purpose, research questions and objectives
- Choosing, evaluating and reviewing research literature
- Selection of variables through construct conceptualization and defining variables
- Choosing research design based on research problem
- Choosing right sampling method and estimating sample size
- Developing research methods and tools – questionnaires, interview schedule, check lists and focus group guides
- Writing a research proposal
- Field data collection using research methods and tools
- Testing reliability and validity of research instruments
- Hands on experience in using SPSS for coding, data exploration, editing, analysis and interpretation Formulation of secondary tables based on objectives of research
- Writing report, writing of thesis and research articles

- Presentation of reports

Suggested Reading

Babbie E. 2008. The basics of social research. 4th ed. Belmont, CA, USA; Thompson Wordsworth. Creswell JW. 2009. Research design: Qualitative, quantitative, and mixed methods approaches.Third edition. Thousand Oaks: Sage Publications.

Creswell JW. 2012. Educational research: Planning, conducting, and evaluating quantitative and qualitative research. Fourth edition. Boston, MA: Pearson.

Kerlinger FN and Lee HB. 2000. Foundations of Behavioral Research. Orlando, FL: Harcourt College Publishers.

Kumar R. 2014. Research Methodology: A Step- by- Step Guide for Beginners. Fourth. Edition.Thousand Oaks, California: Sage Publications.

Malhotra NK. 2010. Marketing research: An applied orientation. Sixth Edition. Upper Saddle River, NJ: Prentice Hall.

NeumanWL. 2006. Social Research Methods: Qualitative and Quantitative Approaches. Toronto: Pearson.

Sekaran U and Bougie R. 2013. Research Methods for Business A Skill-Building Approach. 6th Edition, Wiley, New York.

Sendhil R, Kumar A, Singh S, Verma A, Venkatesh K and Gupta V. 2017. Data Analysis Tools and Approaches (DATA) in Agricultural Sciences. e-Compendium of Training-cum-Workshop organised at the ICAR-IIWBR during March 22-24, 2017. pp 1-126.

Sivakumar PS, Sontakki BS, Sulaiman RV, Saravanan R and Mittal N. (eds). 2017. Good Practices in Agricultural extension Research. Manual on Good Practices in Extension Research and Evaluation. Agricultural Extension in South Asia. Centre for Research on Innovation and Science and Policy (CRISP), Hyderabad. India.

Sivakumar PS and Sulaiman RV. 2015. Extension Research in India-Current Status and Future Strategies. AESA Working Paper 2. Agricultural Extension in South Asia. http://
www.aesanetwork.org/aesa-working-paper-2-on-eXtension-research-in-india-current-status-and-future-strategies-p-sethurman-sivakumar-and-rasheed-sulaiman-v-december- 2015/

Couse Code: EXTN
0505 Credit Hours: 2+1
Course Title: Capacity Development

Objectives

1. To comprehend the ideas of education, capacity development, capacity building, and human resource development.
2. To inform students of methodologies, tactics, need assessments, and methods/tools for building capacity.
3. To familiarise students with project proposal, HRD and capacity development methods.

At the end of the course the students will be able to achieve the following outcomes:

Course Outcomes

CO1: Understand the ideas of education, capacity development, capacity building, and human resource development.
CO2: Gain knowledge on methods, approaches, need assessments, and costs associated with building capacity.
CO3: Acquire knowledge of designing, organising, implementing, and assessing capacity building programmes.
CO4: Develop ability for need analysis and project proposal.
CO5: Comprehend different capacity development methods and tools and impact assessment.

CO-PSO Mapping:

	PSO1	PSO2	PSO3
CO1	✔		✔
CO2		✔	
CO3		✔	✔
CO4			✔
CO5	✔		✔

Theory
UNIT
I

Capacity Development–An Overview: Training, capacity building, capacity development and HRD-Meaning and differences; Need and principles of capacity development; Types and levels of capacities - Institutional capacities (include the rules, regulations and practices that set the overarching contextual environment), Organisational capacities (how various actors come together to perform given tasks), Individual capacities (technical, functional and leadership skills). Types of capacity building - Based on structure (structured, semi-structured & unstructured), Based on context (orientation, induction and refresher), and other categories (online, Webinar, distance etc.). Components of capacity development; Capacity development cycle.

UNIT II

Capacity Development- Approaches and Strategies: Capacity Development Dilemma- Theory versus Practice, Trainee versus Task, Structured versus Unstructured, Generic and Specific; Approaches in Capacity Development -Informative approach, Participatory approach, Experimental approach/ Experiential, Performance based approach; Capacity

Development Strategies -Academic strategy, Laboratory strategy, Activity strategy, Action strategy, Personal development strategy, Organizational development strategy.
Steps in Designing and Planning of Capacity Development-

Step 1. Select the participants, Step 2. Determine the participants‘ needs, Step 3. Formulate goal and objectives, Step 4. Outline the content, Step 5. Develop instructional activities, Step

6. Prepare the design, Step 7. Prepare evaluation form, Step 8. Determine follow-up activities; Organising capacity development programme; Operational arrangements at different stages- Before the programme, During the programme, Middle of the programme, At the end of the programme, After the programme, Follow up; Stakeholders‘ responsibilities.

UNIT III

Planning and Organization of Capacity: Development Programmes Concept of Need Assessment; Approaches in Need Analysis- Performance Analysis, Task Analysis, Competency Study; Needs Survey.

UNIT IV

Capacity Development Needs Assessment Methods: Data Collection Methods in Identifying Needs - Rational Methods (Observation, Informal talks, Complaints, Comparison, Analysis of report, Opinion poll, Buzz session, Analysis of the new programme), Empirical Methods (Job analysis, Performance evaluation, Checklist or Questionnaire Method, Tests, Critical Incident Technique, Card Sort Method, Focus Group Discussion, Interview, SWOT Analysis); Information and Skills required in Need Analysis; Identification of Needs through Task Analysis - Task identification, Task Analysis, Gap Analysis.

UNIT V

Capacity Developer (Trainer): Meaning and concept; Types of Capacity Developers (regular, ad-hoc, part time, guest and consultants); Roles of Capacity Developer (explainer, clarifier, supporter, confronter, role model, linker, motivator, translator/ interpreter, change agent); Good Capacity Developer – Qualities, skills and roles Qualities, Skills (Intrapersonal & Inter personal), Roles (Manager, Strategist, Task Analyst, Media Specialist, Instructional Writer, Marketer, Facilitator, Instructor, Counsellor, Transfer Agent, Evaluator); Capacity Development Centres and Locations; Organisation‘s Role in Capacity Development.

UNIT VI

Project Proposal: Concept and Meaning; Steps in Project Formulation- Review of past proposals, Consulting experts, consultants, and previous organizers, Review past project evaluation reports, Interact with the prospective beneficiaries; Format for Writing Project Proposal (LFA).

UNIT VII

Capacity Development Methods –Lecture, Discussion, Syndicate, Seminars, Conference, Symposium, Role Play, Case study, Programmed Instruction, T - group/ Laboratory methods; Factors Determining Selection of Methods - Capacity development objectives, subject matter, categories of participants, and the available resources like time, location, budget; Capacity Development Aids.

UNIT VIII

Capacity Development Programme Evaluation - Meaning & Importance; Purpose of Evaluation; Principles of Evaluation; Types of Evaluation – Formative, Summative, Kirkpatrick‘s four levels of evaluation; Process of Evaluation- Evaluation at the beginning, Evaluation during the programme, Evaluation at the end; Use of evaluation findings; Statistical Tools for evaluation.

UNIT IX

Impact Assessment- Meaning, Need, Features, Benefits, Concepts; Indicators for Impact Assessment - Direct indicators, Indirect or proxy indicators, Quantitative indicators, Qualitative indicators, Result chain / hierarchy of indicators; Methods of Impact Evaluation-

Learning retention of participants (KOSA), Impact on the job performance, Impact on organizational effectiveness, Impact on stakeholder‘s competency.

UNIT X

HRD: Meaning, Importance and Benefits; Types of HRD Systems & Sub-systems Career system (Manpower planning, Recruitment, Career planning, Succession planning, Retention), Work system (Role analysis, Role efficacy, Performance plan, Performance feedback and guidance, Performance appraisal, Promotion, Job rotation, Reward), Development system (Induction, Training, Job enrichment, Self-learning mechanisms, Potential appraisal, Succession development, Counselling, Mentor system), Self-renewal system (Survey, Action research, Organisational development interventions), Culture system (Vision, mission and goals, Values, Communication, Get together and celebrations, Task force, Small groups); Components of HRD System - Performance Appraisal, Potential Appraisal, Task System, Development System, Socialisation System, Governance; Functions of HRD-Organisational Development, Career Development, Capacity Development.

Practical

- Capacity development needs assessment exercise
- Capacity development project formulation exercise
- Planning organizing and conducting an extension capacity development programme
- Designing a programme
- Writing learning objectives
- Developing objectives into curriculum
- Training plan
- Organizing capacity development workshop
- Evaluation with pre- and post-training tests
- Training methods – Practicing each method mentioned in contents as group exercise

Suggested Reading

ADB. 2009. Training Needs Assessment and Strategic Training Plan.

Bentaya GM, and Hoffmann V (Eds). 2011. Rural Extension Volume 3 -Training Concepts and Tools. Margraf Publishers GmbH, Scientific books, KanalstraBe 21; D-97990, Weikersheim, 191 pp.

DFID .2003. Promoting Institutional and Organisational Development. A Source Book of Tools and Techniques, Department for International Development, United Kingdom

DoPT.2014. Civil Services Competency Dictionary: Strengthening Human Resource Management of Civil Service. Department of Personnel and Training, Government of India

ICAR 2015. Training Policy 2015, Indian Council of Agricultural Research.

IISD 2015. Appreciative Inquiry and Community Development. International Institute for Sustainable Development.

LENCD 2011. How to assess existing capacity and define capacity needs, Learning Network on Capacity Development.

Maguire. 2012. Module 2: Agricultural Education and Training to Support Agricultural Innovation Systems. Overview. Agricultural Innovation Systems: An Investment Source

book. The World Bank.
Mbabu AN and Hall A. 2012. Capacity Building for Agricultural Research for Development-Lessons from Practice in Papua New Guinea. United Nations University-Maastricht Economic and Social Research Institute on Innovation and Technology (UNU-MERIT). https://www.merit.unu.edu/archive/docs/hl/201302_Capacity%20Building%20for%20Agricultural%20Research%20Development_Final.pdf
Mittal N, Sulaiman RV and Prasad R M. 2016. Assessing Capacity Needs of Extension and Advisory Services a Guide for Facilitators. Agricultural Extension in South Asia. http://www.aesanetwork.org/assessing-capacity-needs-of-eXtension-and-advisory-services-a-guide-for-facilitators/
Mishra DC. 1990. New Directions in Extension Training. Directorate of Extension, Ministry of Agriculture, Govt. of India, New Delhi.
OECD/DAC. 2006. The Challenge of Capacity Development: Working Towards Good Practice, Organisation for Economic Cooperation and Development.
Pretty JN, Gujit I, Thompson J, and Scoones I. 1995. A Trainer‘s Guide for Participatory Learning and Action. IEED Participatory Methodology Series. Policy-makers, New Delhi: Sage Publications, pp. 359
Rolf PL and Udai P. 1990. Training for Development, (3rd edn) by (West Hartford, Kumarian Press, 1990, pp. 333.
SIDA.2000. Capacity Development. SIDA Working Paper No. 4. Analysis of Needs for Capacity Development.
SIDA. 2000. Working Paper No. 4. Analysis of Needs for Capacity Development
Sulaiman RV and Mittal N. 2016. Capacity Needs of Extension and Advisory Services (EAS) in South Asia. Policy Brief No 1. Agricultural Extension in South Asia. http://www.aesanetwork.org/policy-brief-no-1-capacity-needs-of-eXtension-an advisory-services-east-in-south-asia/
Swanson BE and Rajalahti R. 2010. Strengthening Agricultural Extension and Advisory Services.A Guide for Facilitators.
TAP. 2013. Capacity Development for Agricultural Innovation Systems - Key Concepts and Definitions. Tropical Agricultural Platform
TAP. 2016. Common Framework on Capacity Development for Agricultural Innovation Systems. Guidance Note on Operationalization, Tropical Agricultural Platform
UNDP. 1998. Capacity Assessment and Development in a Systems and Strategic Management Context. Technical Advisory Paper No. 3. Management Development and Governance Division Bureau forDevelopment Policy, January 1998, United Nations Development Programme
UNDP. 1998. CapacityAssessment and Development in a Systems and Strategic Management Context. Technical Advisory UNU-MERIT, Netherlands.
UNDP. 2008. Capacity Assessment Methodology. User‘s Guide. Capacity Development Group. Bureaufor Development Policy.
UNDP. 2009. Capacity Development: A UNDP Primer, United Nations Development Programme WAC. 2013. Assessing Capacity Needs and Strategy Development for Grassroots Rural Institutions: A Guide for Facilitators. World Agroforestry Centre (WAC)

Suggested Website
TAP–Tropical Agriculture Platform for Capacity Development– https://www.tapipedia.org/ FAO–FAO Capacity Development– http://www.fao.org/capacity-development/en/ GFRAS–Global Forum for Rural Advisory Services– http://www.g-fras.org/en/ AESA–Agricultural Extension in South Asia– http://www.aesanetwork.org/

Couse Code: EXTN
0506 Credit Hours: 2+1
Course Title: ICTs for Agricultural Extension and Advisory Services

Objectives

1. To orient students with various ICT initiatives, knowledge management methods, and application features.
2. To familiarize students with developments in data analytics and smart/disruptive technologies and practical knowledge of using ICTs.
3. To impart knowledge on how ICTs can be effectively used for agricultural extension and consulting services.

At the end of the course the students will be able to achieve the following outcomes:

Course Outcomes

CO1: Recognize the ICT application elements.
CO2: Analyse ICT efforts and smart/disruptive technologies critically.
CO3: Carry out extension duties using ICTs.
CO4: Involve stakeholders in the process of knowledge management.
CO5: Understand the principles and significance of agricultural advising and extension services using ICT tools.

CO-PSO Mapping:

	PSO1	PSO2	PSO3
CO1	✔		
CO2	✔	✔	✔
CO3		✔	✔
CO4		✔	✔
CO5	✔		✔

Theor
y
UNIT
I

ICTs- Concepts and Status: ICTs- meaning, concepts, basics of ICTs, global and national status, types and functions of ICTs, innovations, meaning of e-Governance, e-learning, m-Learning, advantages and limitations of ICTs.

UNIT II

ICTs in Knowledge Management: Knowledge management-meaning, approaches and tools. Role of ICTs in Agricultural Knowledge Management.

UNIT III

e-Extension initiatives in Agriculture and allied sectors: e-Extension, overview on Global and

national e-extension initiatives, Inventory of e-Extension initiatives in Agriculture and allied sectors from Central and State governments, ICAR, SAUs, private sector and NGO initiatives in India.

UNIT IV

ICT Applications: Knowledge centres (tele centers), digital kiosks, websites and web portals, community radio, farmers call centres, mobile phone based advisory services and mobile applications (m-Extension, m-Learning), Self-learning CDs on Package of practices, social media, digital videos, Market Intelligence and Information Systems- ICT enabled Supply-Chains and Value-Chains/ e-Marketing (e-NAM, AGMARKNET, etc.).

UNIT V

ICT Expert Systems: Expert System/ Decision Support System/ Management Information Systems, Farm Health Management & Intelligence System for Plant Health, Animal Health, Soil Health, Fishery, Water, Weather, etc.

UNIT VI

ICT Networks: Global and regional knowledge networks, international information management systems, e-Learning platforms (MOOCS, Course CCRA, Edu-EX, etc.), e-Governance, Systems; digital networks among extension personnel, Farmer Producers, Organisations (FPOs)/ SHGs/ Farmers Groups.

UNIT VII

Policies in Knowledge Management: Global policy/ Standards on e-Governance, National policy on e-governance, Open Data / Open Gov Standards and Open Source etc.; Language Technology Applications; National e-Agriculture policy/ Strategies/ guidelines.

UNIT VIII

Web Standards: Web standards, creating and writing for web-portals, development of mobile applications, developing digital videos- story board- video recording- video editing, types of blogs and writing guidelines.

UNIT IX

Social Media Applications to engage audience: Video conference, live streaming and webinars, types and functions of social media applications, guidelines for preparing social media content, engaging audience and data-analytics.

UNIT X

Smart Technologies: Open technology computing facilities, System for data analytics/ mining/ modelling/ Development of Agricultural simulations; Remote Sensing, GIS, GPS, Information Utility (AIU); disruptive technologies- Analysis; Internet of Things (IoTs), Drones, Artificial intelligence (AI), block chain technology, social media and Big Data analytics for extension.

UNIT XI

Human Computer Interactions: Human Centered Learning/Ergonomics/ Human Computer Interactions-Meaning; Theories of multimedia learning - Sweller‘s cognitive load theory, Mayer‘s cognitive theory of multimedia learning, Schnotz‘s integrative model of text and picture comprehension, van Merriënboer‘s four-component instructional design model for multimedia learning; Basic Principles of Multimedia Learning - Split-attention, Modality, Redundancy, Coherence, Signaling, segmenting, pre-training, personalization, voice embodiment; Advanced principles - Guided discovery, worked examples, Self-explanation, drawing, feedback, multiple representation, Learner control, animation, collaboration, prior knowledge, and working memory. Designing ICT gadgets based on human interaction principles - Interactive Design-Meaning, importance; Approaches of interactive design - user-centered design, activity- centered design, systems design, and genius design; Methods of interactive design- Usability testing methods.

Practical

- Content and client engagement analysis
- Designing extension content for ICTs
- Creating and designing web portals, blogs, social media pages
- Developing digital videos
- Live streaming eXtension programmes and organising webinars
- Working with Farmers call centres
- Engaging with professional digital networks
- Writing for digital media

Suggested Reading

Andres D and Woodard J. 2013. Social media handbook for agricultural development practitioners. Publication by FHI360 of USAID. http://ictforag.org/toolkits/social/SocialMedia4 AgHandbook.pdf

Barber J, Mangnus E and Bitzer V. 2016. Harnessing ICT for agricultural extension. KIT Working Paper

Bheenick K and Bionyi I. 2017. Effective Tools for Knowledge Management and Learning in Agriculture and Rural Development. CTA Working paper. https://publications.cta.int/media/publications/downloads/1986_PDF.pdf

Fafchamps M and Minten B. 2012. Impact of SMS based Agricultural Information on Indian Farmers. The World Bank Economic Review, Published by the OXford University Press on behalf of the International Bank for Reconstruction and Development.

George T, Bagazonzya H, Ballantyne P, Belden C, Birner R, Del CR and Treinen S. 2017. ICT in agriculture: connecting smallholders to knowledge, networks, and institutions. Washington, DC: World Bank. https://openknowledge.worldbank.org/handle/10986/12613 16

Heike Baumüller. 2018. The little we know: An exploratory literature review on the utility of mobile phone enabled services for smallholder farmers. Journal of International Development. 30, 134–154.

Laurens K. 2016. NELK Module 6: Basic Knowledge Management and Extension, New Extensionist Learning Kit (NELK), Global Forum for Rural Advisory Services (GFRAS).

Mayer RE. 2005. The Cambridge handbook of multimedia learning. New York: University of Cambridge.
MEAS & Access Agriculture 2013. A Guide to Producing Farmer-to-Farmer Training Videos. https://www.agrilinks.org/sites/default/files/resource/files/MEAS%20Guide%20to%20Producing%20Farmer-to-Farmer%20Training%20 Videos%202013_04.pdf
Meera SN.2013. Extension, ICTs and Knowledge Management: The 10 difficult questions. Blog 15. Agricultural Extension in South Asia.http://www.aesanetwork.org/eXtension-icts-and-knowledge-management-the-10-difficult- questions/
Meera SN. 2017. Disruptive Technologies – Big Data and Internet of Things in Strengthening Extension & Advisory Services. Blog 68. Agricultural Extension in South Asia. http://www.aesanetwork.org/disruptive-technologies-big-data-and-internet-of-things-in-strengthening-extension-advisory-services/
Meera SN. 2018. A Treatise on Navigating Extension and Advisory Services through Digital Disruption. Blog 90. Agricultural Extension in South Asia. http://www.aesanetwork.org/a-treatise-on-navigating-eXtension-and-advisory-services-through-digital-disruption/
Mittal N, Surabhi, Gandhi, Sanjay and Gaurav T. 2010. Socio-Economic Impact of Mobile Phones on Indian Agriculture. ICRIER Working Paper No. 246, Indian Council for Research on International Economic Relations (ICRIER), New Delhi.
Preece J, Rogers Y, & Preece, J. 2007. Interaction design: Beyond human-computer interaction. Chichester: Wiley.
Saravanan R, Sulaiman RV, Davis K and Suchiradipta B. 2015. Navigating ICTs for Extension and Advisory Services. Note 11. GFRAS Good Practice Notes for Extension and Advisory Services. GFRAS: Lindau, Switzerland. https://agrilinks.org/sites/default/files/resource/files/gfras-ggp-note11_navigating_icts_for_ras_1.pdf
Saravanan R and Suchiradipta B. 2015. mExtension – Mobile Phones for Agricultural Advisory Services. Note 17. GFRAS Good Practice Notes for Extension and Advisory Services. GFRAS: Lindau, Switzerland. www.g-fras.org/en/download.
Saravanan R and Suchiradipta B. 2016. Social media policy guidelines for agricultural extension and advisory services, GFRAS interest group on ICT4RAS, GFRAS: Lindau, Switzerland. www.g-fras.org/en/knowledge/gfras-publications.html?download
Saravanan R. 2010. (Ed.) ICTs for Agricultural Extension: Global Experiments, Innovations and Experiences, New India Publishing Agency (NIPA), New Delhi.
http://www.saravananraj.net/wp-content/uploads/2014/12/32_India_ICTs-for-Agricultural-Extension_Saravanan.pdf
Saravanan R, Suchiradipta B, Chowdhury A, Hambly OH and Hall K. 2015. Social Media for Rural Advisory Services. Note 15. GFRAS Good Practice Notes for EXtension and Advisory Services. GFRAS: Lindau, Switzerland. www.g-fras.org/en/download .
Saravanan R, Suchiradipta B, Meera SN, Kathiresan C and Anandaraja N. 2015. Web Portals for Agricultural Extension and Advisory Services. Note 16. GFRAS Good Practice Notes for Extension and Advisory Services. GFRAS: Lindau, Switzerland. www.g-fras.org/en/download.html?
Saravanan R.2014. (Ed.). Mobile Phones for Agricultural Extension: Worldwide mAgri

Innovations and Promise for Future, New India Publishing Agency, New Delhi.

http://www.saravananraj.net/wp-content/uploads/2014/12/27_Mobile-phones-for-
Sophie T and Alice VDE.2018. Gender and ICTs - Mainstreaming gender in the use of information and communication technologies (ICTs) for agriculture and rural development, FAO. http://www.fao.org/publications/card/en/c/I8670EN
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Vignare K. 2013. Options and strategies for information and communication technologies within agricultural extension and advisory services. MEAS Discussion paper. http://meas.illinois.edu/wpcontent/uploads/2015/04/Vignare-K-2013-ICT-and-Extension-MEAS-Discussion-Paper.pdf
World Bank. 2017. ICT in Agriculture (Updated Edition): Connecting Smallholders to Knowledge, Networks, and Institutions. Washington, DC: World Bank. https://openknowledge.worldbank.org/handle/10986/27526

Suggested Website

FAO–Food and Agricultural Organisation (Research and Extension) http://www.fao.org/research-and-extension/en/
CTA–The Technical Centre for Agricultural and Rural Cooperation: Digitalization– https://www.cta.int/en/channel/digitalisation-sid05951b8c7-e611-4f34-9ae6-8c0fc0c822bc
GFRAS–Global Forum for Rural Advisory Services– http://www.g-fras.org/en/ AESA–Agricultural Extension in South Asia– http://www.aesanetwork.org/

Couse Code: EXTN
0507 Credit Hours: 2+1
Course Title: Evaluation and Impact Assessment

Objectives

1. To introduce students to evaluation and impact assessment concepts, theories, and models.
2. To familiarize students with various types of evaluation, such as formative, summative, process, and impact evaluation.
3. To teach students evaluation frameworks and logic models, including setting clear goals, objectives, indicators, and targets.

At the end of the course the students will be able to achieve the following outcomes:

Course Outcomes

CO1: Demonstrate a comprehensive understanding of the key concepts, principles, and theories of

evaluation and impact assessment.

CO2: Design effective evaluation plans, including developing clear objectives, indicators, and data collection methods.

CO3: Understand collecting and managing data using various quantitative and qualitative methods, demonstrating proficiency in sampling techniques.

CO4: Comprehend the ability to analyse and interpret data using appropriate statistical and analytical techniques.

CO5: Create logic models and evaluation frameworks that depict the relationships between program components and outcomes.

CO-PSO Mapping:

	PSO1	PSO2	PSO3
CO1			✔
CO2	✔		✔
CO3			✔
CO4			✔
CO5			✔

Theor
y
UNIT
I

Concept of Evaluation: Meaning and concept in different contexts; Why Evaluation is Done and When? Programme planning, analyse programme effectiveness, decision making, accountability, impact assessment, policy advocacy; Objectives, types, criteria and approaches of programme evaluation, evaluation principles; the context of program evaluation in agricultural extension; Role and Credibility of Evaluator: Role as educator, facilitator, consultant, interpreter, mediator and change agent. Competency and credibility of evaluator

UNIT II

Evaluation Theories: Evaluation theory vs. practice – synergistic role between practice and theory in evaluation; Evaluation theories - Three broad categories of theories that evaluators use in their works - programme theory, social science theory, and evaluation theory (other theories/ approaches - Utilization-Focused Evaluation & Utilization-Focused Evaluation (U-FE) Checklist, Values Engaged Evaluation, Empowerment Evaluation, Theory-Driven Evaluation). Integration between theory and practice of evaluation: –evaluation forums, workshops, conferences and apprenticeship/ internship.

UNIT III

How to Conduct Evaluation: Ten Steps in programme evaluation: (1) Identify and describe programme you want to evaluate (2) Identify the phase of the programme (design, start-up, on-going, wrap-up, follow-up) and type of evaluation study needed (needs assessment, baseline, formative, summative, follow-up) (3) Assess the feasibility of implementing an evaluation (4) Identify and consult key stakeholders (5) Identify approaches to data collection (quantitative, qualitative, mixed) (6) Select data collection techniques (survey interviews and questionnaires with different types) (7) Identify population and select sample (sampling for evaluation, sample size, errors, sampling techniques (8) Collect, analyse and interpret data (qualitative and quantitative evaluation data analysis) (9) Communicate findings (reporting plan, evaluation report types, reporting results, reporting tips, reporting negative findings (10) Apply and use findings (programme continuation/ discontinuation, improve on-going programme, plan future programmes and inform programme stakeholders).

UNIT IV

Evaluating the Evaluation - 10 Steps as above with focus on conceptual clarity, representation of programme components and stakeholders, sensitivity, representativeness of needs, sample and data, technical adequacy, methods used for data collection and analysis, costs, recommendations and reports.

UNIT V

SWOT Analysis and Bar Charts: SWOT Analysis – Concept, origin and evolution; SWOT As a Programme Management Tool; Conducting SWOT Analysis - Common Questions in SWOT Analysis; Advantages and Disadvantages of SWOT; Bar Charts (Gantt Charts and Milestone Charts) - Characteristics, advantages and limitations.

UNIT VI

Networks – Introduction, origin and widely used networks (Programme Evaluation and Review Technique (PERT) and Critical Path Method (CPM), differences between PERT and CPM, advantages and disadvantages. Networks Terminology – Activity, Dummy activity, Event (predecessor event, successor event, burst event, merge event, critical event), Earliest Start Time (EST), Latest Start Time (LST), Critical Path, Critical Activity, Optimistic time (To), Pessimistic time (Po), Most likely time (TM), Expected time (TE), Float or Slack, Event Slack, Lead time, Lag time, Fast tracking, Crashing critical path, Acclivity Table, Danglers, Normal Time. Rules for Preparation of Networks and Steps in Network Preparation with example.

UNIT VII

Bennett‘s Hierarchy of Evaluation: Introduction to Bennett‘s hierarchy – Background and description; Relation between programme objectives & outcomes at 7 levels of Bennett‘s hierarchy – Inputs, activities, participation, reactions, KASA changes, practice and behaviour changes, end results. Advantages and Disadvantages of Bennett‘s hierarchy

UNIT VIII

Logic Framework Approach (LFA): Introduction to LFA – Background and description; Variations of LFA - Goal Oriented Project Planning (GOPP) or Objectives Oriented Project Planning (OOPP); LFA Four-by-Four Grid – Rows from bottom to top (Activities, Outputs, Purpose and Goal & Columns representing types of information about the events (Narrative description, Objectively Verifiable Indicators (OVIs) of these events taking place, Means of Verification (MoV) where information will be available on the OVIs, and Assumptions). Advantages and Disadvantages of LFA.

UNIT IX

Introduction to Impact Assessment: Concept of Impact Assessment: Meaning, concept and purpose in different contexts; Impact Assessment Framework: Meaning of inputs, outputs, outcomes, impacts and their relation with monitoring, evaluation and impact assessment.

UNIT X

Impact Assessment Indicators: Indicators for impact assessment – meaning and concept; Selecting impact indicators; Types of impact indicators for technology and extension advisory services - social and behavioral indicators, socio-cultural indicators, technology level indicators, environmental impact assessment indicators and institutional impact assessment indicators.

UNIT XI

Approaches for Impact Assessment: Impact assessment approaches – Quantitative, qualitative, participatory and mixed methods with their advantages and disadvantages; Quantitative Impact Assessment Types – Based on Time of Assessment (Ex-ante and ex-post), Based on Research Design (Experimental, quasi experimental, Non-experimental). Econometric Impact Assessment: - (Partial Budgeting Technique, Net Present Value, Benefit Cost Ratio, Internal Rate of Return, Adoption Quotient, etc.). Qualitative and Participatory Impact Assessment Methods.

UNIT XII

Environment Impact Assessment (EIA): Concept of EIA – Introduction, what it is? Who does it? Why it is conducted? How it is done? Benefits and important aspects of EIA-risk assessment, environmental management and post product monitoring. Environmental Components of EIA – air, noise, water, biological, land; Composition of the expert committees and Steps in EIA process - screening, scoping, collection of baseline data, impact prediction, mitigation measures and EIA report, public hearing, decision making, monitoring and implementation of environmental management plan, assessment of alternatives, delineation of mitigation measures and EIA report; Salient Features of 2006 Amendment to EIA Notification - Environmental Clearance/Rejection, participants of EIA; Shortcomings of EIA and How to improve EIA process?

Practical

- Search the literature using web / printed resources and identify evaluation indicators for the following:
  - Utilization-Focused Evaluation
  - Values Engaged Evaluation
  - Empowerment Evaluation
  - Theory-Driven Evaluation
- Visit Directorate of Extension in your university and enquire about extension programmes being implemented / coordinated by Directorate. Develop an evaluation proposal of any

one programme using _Ten Steps in Programme Evaluation‘ discussed in the theory class.

- Review any comprehensive programme evaluation report from published sources. Evaluate the report and write your observations following the _Evaluating the Evaluation‘ approach.
- Identify at least four agriculture development programmes and their objectives being implemented in your state. Write two attributes each on Strengths, Weaknesses, Opportunities and Threats related to the identified programme objectives in the SWOT grid.
- Identify an on-going development programme and make-out 6 activities from the programme.
- Draw a Gantt chart for 12 months programme activities.
- Write a report on evaluation hierarchy levels and indicators as per Bennett‘s hierarchy of evaluation for any development programme or project.
- Develop LFA four-by-four grid for any development programme or project with activities, outputs, purpose and goal and objectively verifiable indicators, means of verification & assumptions.
- Visit a nearby KVKs / ATIC. Select any agriculture technology with package of practices and extension advisory services promoted by KVK / ATIC.
- Identify impact assessment indicators for social and behavioral indicators, socio-cultural indicators, technology level indicators, environmental impact assessment indicators and institutional impact assessment indicators.
- Refer any Environment Impact Assessment report and analyse steps in EIA. Write your observations.

Suggested Reading

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Venkateswarlu, K and Raman, K.V. 1993. Project Management Techniques for R&D in Agriculture. Sterling Publishers Pvt.Ltd., New Delhi.
Wholey JS, Harty HP and Newcomer KE. 1994. Handbook of practical program evaluation. San Francisco, USA: Jossey-Bass Publishers.

Suggested Website

Better Evaluation– www.betterevaluation.org
TAP– Tropical Agriculture Platform: Monitoring and Evaluation - www.tapipedia.org GFRAS– Global Forum for Rural Advisory Services http://www.g-fras.org/en/
AESA– Agricultural EXtension in South Asia http://www.aesanetwork.org/ USAID– United States Agency for International Development: Evaluation https://www.usaid.gov/evaluation

MINOR COURSES

Couse Code: EXTN

0508 Credit Hours: 2+1

Course Title: Managing Extension Organizations

Objectives

1. To provide students a comprehensive understanding of the management of extension organizations.
2. To impart knowledge on the principles and practices of effective management within

extension organizations.

3. To foster critical thinking and problem-solving abilities relevant to extension management.

At the end of the course the students will be able to achieve the following outcomes:

Course Outcomes

CO1: Understand the concept of management and extension management.

CO2: Gain knowledge on administration, supervision and approaches to management.

CO3: Develop a proficiency in strategic planning and program development within extension contexts.

CO4: Acquire leadership, communication, and teamwork skills necessary for managing extension organizations.

CO5: Apprehend knowledge of supervision, control and MIS in extension organisations.

CO-PSO Mapping:

	PSO1	PSO2	PSO3
CO1	✔		
CO2	✔	✔	
CO3			✔
CO4		✔	✔
CO5		✔	✔

Theory

UNIT I

Management- An Over view: Management and importance; Extension management – Meaning, concept, nature and and importance; and theories of management. Management, administration and supervision - meaning, definition and scope; Approaches to management, Principles, functions and levels of management; Qualities and skills of a manager; Interpersonal relations in the organization; Reporting and budgeting

UNIT II

Extension Management in public, private sector and other sectors: Extension management (POSDCORB) in public sector, Department of Agriculture, Agricultural Technology Management Agency (ATMA), Krishi Vigyan Kendra (KVK), SAUs, ICAR Institutes, Private sector, Cooperatives, NGOs, FPOs etc. Organisational Structure, Relations between different units- Challenges in management. Decision making – Concept, Types of decisions, Styles and

techniques of decision making, Steps in DM Process, Guidelines for making effective decisions; Human Resource Management: Manpower planning, Recruitment, Selection, Placement and Orientation, Training and Development; Dealing with fund and staff shortages in different extension organizations (KVK, ATMA etc.); Leadership – Concept, Characteristics, Functions, Approaches to leadership, Leadership styles; Authority and responsibility, Delegation and decentralization, line and staff relations; Challenges of co-ordination in extension organizations; Managing interdepartmental coordination and convergence between KVK, ATMA and line departments; Coordinating pluralism in extension services; Challenges in managing public-private partnerships (PPPs) at different levels in agricultural development in general and extension in particular; Performance appraisal – Meaning, Concept, Methods.

UNIT III

Motivation and Communication: Managing work motivation – Concept, Motivation and Performance, Approaches to motivation, team building; Organizational Communication – Concept, Process, Types, Networks, Barriers to Communication; Mentoring, Time management, Team work and team-building strategies; Modernization of information handling

UNIT IV

Supervision and Control: Supervision – Meaning, Responsibilities, Qualities and functions of supervision, Essentials of effective supervision; Managerial Control – Nature, Process, Types, Techniques of Control, Observation, PERT and CPM, Management Information Systems (MIS): Concept, tools and techniques, MIS in extension organizations.

Practical

- Simulated exercises on techniques of decision making
- Study the structure and function of agro-enterprises, Designing organizational structure/ organograms.
- Group activity on leadership development skills
- Simulated exercise to understand management processes
- Field visit to extension organizations (ATARI, KVKs, NGOs), FPOs, dairy cooperatives to understand the functions of management
- Practical exercises on PERT & CPM
- Group exercise on development of short term and long-term plans for agro- enterprises
- Developing model agriculture-based projects including feasibility study, financial planning and cost-benefit analysis

Suggested Reading

Bitzer V. 2016. Incentives for enhanced performance of agricultural extension systems, KIT Working Paper 2016-6, Royal Tropical Institute, Amsterdam

Bitzer V, Wennik, B and de Steenhuijsen, B. 2016. The governance of agricultural extension systems, KIT Working Paper 2016-1Royal Tropical Institute, Amsterdam

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Van den Ban AW and Hawkins HS. 1998. Agricultural extension- Chapter 10, BSL, CBS Publishers and Distributors.

Couse Code: EXTN

0509 Credit Hours: 1+1

Course Title: Enabling Innovation

Objectives

1. To introduce students to the fundamental concepts of innovation.
2. To provide an overview of the broader innovation ecosystem.

3. To impart knowledge on fostering a culture of innovation within organizations.

At the end of the course the students will be able to achieve the following outcomes:

Course Outcomes

CO1: Comprehend a deep understanding of innovation's fundamental concepts and definitions and their significance in various contexts.

CO2: Identify and analyse the internal and external factors that drive innovation within organizations and industries.

CO3: Understand the broader innovation ecosystem.

CO4: Evaluate and apply different innovation strategies to address specific challenges and opportunities.

CO5: Demonstrate enhanced creative thinking skills and the ability to generate innovative ideas through various techniques.

CO-PSO Mapping:

	PSO1	PSO2	PSO3
CO1	✔		
CO2			✔
CO3	✔		
CO4		✔	✔
CO5		✔	✔

Theor
y
UNIT
I

Agricultural Innovation Systems: Concepts and Elements: Origins of the innovation systems concept-Innovation vs Invention; Agricultural Innovation System (AIS) -ToT, FSR, AKIS and AIS compared, Key insights from AIS: How Innovation takes place; Role of different actors in AIS; Importance of interaction and knowledge flows among different actors, Role of Communication in Innovation Process; Role of Extension in AIS, Different views to analyze AIS: structural view, functional view, process view and capacity view.

UNIT II

Enabling Innovation: Role of enabling environment: Policies and institutions in enabling innovation; Role of Government-Innovation Policy: Achieving coordination and policy coherence; Innovation Platforms; Role of Innovation Brokers, Methodologies for AIS Diagnosis: Typologies of existing methodologies-strengths and limitations; Assessing

Extension and Advisory Services within AIS; Capacity Development in AIS: Strengthening capacities to innovate.

UNIT III

Scaling Up: Tools, Approaches and Pathways: Scaling Up: Definitions; Changing views on scaling up: Approaches to Scaling Up: Push, pull, plant, probe: Scaling up pathways: Drivers and spaces for scaling up; Framework and Tools for Scaling up: Planning and implementing a scaling up pathways; Scalability assessment tools; Role of policies in scaling up: Influencing policies for scaling up; Innovation Management for scaling up knowledge and implications for Extension and Advisory Services.

Practical

- Identify one crop/commodity sector and use AIS framework to diagnose actors and their roles, patterns of interaction, institutions determining interaction and the enabling policy environment and develop an AIS Diagnosis Report (Review and Key informant interviews)
- Undertake a case study on a successful case of scaling up knowledge and identify factors that contributed to its success
- Identify one specific knowledge (a technology, an approach) that has been recently introduced and develop an Up-scaling Strategy

Suggested Reading

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system capacity development: Tools, principles or policies?

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Laurens K and Peter G. 2012. The role of innovation brokers in agricultural innovation systems.211-230. 10.1787/9789264167445-19-en. http://siteresources.worldbank.org/INTARD/Resources/335807-1330620492317/9780821386842_ch3.pdf
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World Bank. 2012. Agricultural Innovation Systems: An Investment Sourcebook. Washington DC, World Bank. http://siteresources.worldbank.org/INTARD/Resources/335807-1330620492317/ 9780821386842.pdf

Suggested Website

AESA- Agricultural Extension in South Asia– http://www.aesanetwork.org/

FAO- Food and Agricultural Organisation (Research and Extension)– http://www.fao.org/research-and-eXtension/en/

GFRAS- Global Forum for Rural Advisory Services– http://www.g-fras.org/en/

KIT- Royal Tropical Institute (KIT)-Sustainable Economic Development– https://www.kit.nl/sed/

TAPipedia - Tropical Agriculture Platform– https://www.tapipedia.org/

WUR-Wageningen University and Research Research [Knowledge, Technology and Innovation Group (KTI)]– https://www.wur.nl/en/Research-Results/Chair-groups/Social-Sciences/ KnowledgeTechnology-and-Innovation-Group.htm

Couse Code: ABMN 0511

Credit Hours: 3+0

Course Title: Rural Marketing

Objectives

1. To familiarize students with the possibilities and potential of the rural market.
2. To critically analyse the market opportunities and consumer trends.
3. To orient students on patterns and development of better marketing strategies for the rural areas.

At the end of the course the students will be able to achieve the following outcomes:

Course Outcomes

CO1: Demonstrate a deep understanding of rural markets.

CO2: Analyse rural consumer behaviour.

CO3: Conduct market research in rural areas.

CO4: Understand the government policies and regulations affecting rural marketing.

CO5: Gain knowledge on rural product strategy.

CO-PSO Mapping:

	PSO1	PSO2	PSO3
CO1	✔		
CO2		✔	✔
CO3			✔
CO4	✔		
CO5	✔		✔

Theor
y
UNIT
I
Rural Market Concept & Scope: Concept, Definition and Scope of rural marketing, nature and characteristics of rural markets, potential of rural markets in India, rural V/S urban market.

UNIT II
Environmental factors: Socio-cultural, economic, demographic, technological and other environmental factors affecting rural marketing.

UNIT III
Rural finance: Concept, demand, banking model; Finance Schemes of NABARD, Other Schemes of State Govt, Central Govt.

UNIT IV
Rural consumer‘s behavior: Behavior of rural consumers and farmers; buyer characteristics and buying behavior; customer relationship management, rural market research.

UNIT V
Rural Product strategy: Marketing of consumer durable and non-durable goods and services in the rural markets with special reference to product planning; marketing mix, product mix.

Suggested Reading
Krishnamacharyulu (2010) Rural Marketing: Text and Cases, Pearson India; Second edition.

Kumar D and Gupta P (2019) Rural Marketing: Challenges and Opportunities, First Edition, SAGE publication.

Couse Code: EXTN
0510 Credit Hours: 2+1
Course Title: Gender Mainstreaming

Objectives

1. To learn the concepts of gender and importance of Gender mainstreaming.
2. To understand gender responsibilities and various techniques of gender analysis.
3. To develop capabilities for identifying and addressing gender implications in development programs.

At the end of the course the students will be able to achieve the following outcomes:

Course Outcomes

CO1: Gain knowledge and understand the fundamental concepts and techniques of gender mainstreaming.

CO2: Understand the importance and use of tools for gender analysis.

CO3: Know the approaches and programs undertaken for women empowerment.

CO4: Comprehend the policies and frameworks regarding gender concerns.

CO5: Assess the processes for women entrepreneurship development and women in agri-enterprises.

CO-PSO Mapping:

	PSO1	PSO2	PSO3
CO1	✔		
CO2		✔	✔
CO3	✔	✔	
CO4		✔	✔
CO5	✔		✔

Theory

UNIT I

Historical perspective of gender: Feminism and emergence of gender as a concept, Scope of gender studies in agriculture and rural development

UNIT II

Agrarian Importance of Gender: Understanding the importance of gender in national and global agriculture-Key gender issues and challenges in agriculture - Gender and value chain-Global actions to address gender-needs and strategies to address gender and women empowerment.

UNIT III

Gender related concepts and divides: Understanding of the concepts of gender, gender equality and equity, gender balance, gender blindness, gender relations, gender neutrality, gender bias and discrimination, gender rights, gender roles and responsibilities. Gender budgeting, Gender divides and their implications such as gender digital divide, gender access to resources and inputs divide, gender mobility divide, gender wage divide, Gender needs: practical and strategic.

UNIT IV

Gender analysis: Importance, usage, prerequisites, techniques of gender analysis- Tools for gender analysis

UNIT V

Gender and technology: How gender and technology impact each other, Gender neutral technology, Gender sensitive technology, Gender supportive assistance in technology adoption-Gender in agricultural research and extension.

UNIT VI

Gender mainstreaming: Importance of gender mainstreaming in agriculture, EXtension strategies to address gender issues such as gender and health, nutrition, gender in agricultural value chains, gender and climate change adaptation, gender and globalization& liberalization for mainstreaming gender concerns into the national programmes and policies.

UNIT VII

Women Empowerment: Importance of women empowerment, Current national women empowerment and gender indices. Women empowerment approaches (technological, organizational, political, financial, social, legal and psychological), Case studies based on experiences and learning from various development and rural development programmes

UNIT VIII

Global Best Practices, Policies and Frameworks: Global best practices, women empowerment and gender mainstreaming models and frameworks for addressing gender concerns in agriculture, approaches of various organizations: gender mainstreaming and special women focused programmes in agriculture and rural development.

UNIT IX

Entrepreneurship development for women: Women entrepreneurship development in agriculture and agro processing: current status, women led enterprises, supporting organizations and schemes, Govt. policies, entrepreneurship development programme and process for women in agriculture.

Practical

- Visit to a village for understanding rural gender roles and responsibilities as groups, followed by class presentation by groups
- Exercise for capturing shifts in gender roles and responsibilities
- Conducting gender analysis in a village using gender analysis techniques
- Visit to agencies supporting women empowerment followed by report presentation. Each student to visit a different organization such as State Rural Livelihood Mission, Women Development Corporation, Department of Agriculture, Important NGOs working for women empowerment
- Exercise for identification and prioritization of issues affecting/needs for women empowerment
- Interaction with a successful women entrepreneur/ SHG

Suggested Reading

AGRIPROFOCUS 2014. Gender in value chains Practical toolkit to integrate a gender perspective in agricultural value chain development
https://agriprofocus.com/upload/ToolkitENGender_in_Value_ChainsJan2014compressed

1415203230.pdf
Christine J, Nafisa F and Taylor DS. 2014. Gender and Inclusion Toolbox: Participatory Research in Climate Change and Agriculture. Global Forum for Rural Advisory Services, Switzerland. http://www.gfras.org/en/component/phocadownload/category/17-gender.html?download
Colverson KE. 2015. Gender into Rural Advisory Services. Global Forum for Rural Advisory Services, Switzerland. http://www.g-fras.org/en/good-practice-notes/integrating-gender-into-rural-advisory-services.html#SNote1
Gap in Agricultural Extension and Advisory Services: How to find the best fit for men and women farmers MEAS Discussion Paper 2, Modernizing EXtension and Advisory Services. https://meas.illinois.edu/wp-content/uploads/2015/04/Manfre-et-al-2013-Gender-and-EXtension-MEAS-Discussion-Paper.pdf
Fanzo, J., Marshall, Q., Wong, J., Merchan, R., Haber, M., Souza, A. & Verjee, N. 2015. The Integration of Nutrition into Extension and Advisory Services: A Synthesis of Experiences, Lessons, and Recommendations. Food and Nutrition Bulletin 36(2): 120-137. https://journals.sagepub.com/doi/10.1177/0379572115586783
FAO. 2011. Gender and agricultural value chains A review of current knowledge and practice and their policy implications. ESA Working Paper No. 11-05 (March 2011) http://www.fao.org/docrep/013/am310e/am310e00.pdf
GFRAS. 2013. Gender equality in Rural Advisory Services, Towards a Common Understanding.
Global Forum for Rural Advisory Services, Switzerland.
http://www.g-fras.org/en/component/phocadownload/category/17-gender.html?download
= 169: gender-equality-in-rural-advisory-services-towards-a-common-understanding
GFRAS. 2013. Gender equality in Rural Advisory Services. Global Forum for Rural AdvisoryServices, Switzerland.
http://www.g-fras.org/en/component/phocadownload/category/17-gender.html?download
= 180: gender-equality-in-rural-advisory-services
GFRAS. Gender in Extension and Advisory Services, Module 12, GFRAS New EXtensionist Learning Kit (NELK). Global Forum for Rural Advisory Services.
https://ingenaes.illinois.edu/wp-content/uploads/GFRAS_NELK_Module12_Gender- Manual-2.pdf
GFRAS. 2018. Nutrition-Sensitive Extension. Module 16, GFRAS New Extensionist Learning Kit (NELK). Global Forum for Rural Advisory Services.
http://www.g-fras.org/en/component/phocadownload/category/70-new-extensionist-learning-kit-nelk.html?download =713: module-16-nutrition-sensitive-extension
GIZ. 2013. Gender and Agricultural Extension.
https://www.giz.de/fachexpertise/downloads/giz2012-en-gender-and-agricultural-extension.pdf
Grover I and Grover D. 2002. Empowerment of Women. Agrotech Publishing Academy.
JAEE (Editorial article). 2013. Gender Inequality and Agricultural Extension. The Journal of Agricultural Education and Extension Vol. 19 (5) 433-436.
Jaiswal S. 2013. Research Methodology in Gender Studies. Maxford Dynamic Series: 1-296.
Jessica F. 2015. Integrating Nutrition into Rural Advisory Services and Extension. Global

Forum for Rural Advisory Services, Switzerland. https://www.g-fras.org/en/download.html?download =344: ggp-note-9-integrating-nutrition- into-rural-advisory-services-and-extension

Liz P. 2018. Implementing Gender Transformative Approaches (GTAs) in Agricultural Initiatives. IGENAES and USAID.https://ingenaes.illinois.edu/wp-content/uploads/ING-DP-2018_06-Gender-Transformative- Approaches-in-Agricultural-Initiatives-Poulsen.pdf

Michele MT and Kathleen C. 2014. Increasing access to agricultural extension and advisory services: How effective are new approaches in reaching women farmers in rural areas? International Livestock Research Institute. http://www.gfras.org/en/component/phocadownload/category/17-gender.html?download

Pena I and Garrett J. 2018. Nutrition-sensitive value chains-A guide for project design. International Fund for Agricultural Development (IFAD). https://www.ifad.org/documents/38714170/40804965/NSVC+A+guide+for+project+design+-+Vol.+I.+Web+filepdf.pdf/5177a3c0-a148-4b1f-8fff-967a42f51ce8

Ponnusamy K and Sharma P. 2015. Gender Sensitization for Development. NDRI Publ.No.130/ 2015.

Raj MK. 1998. Gender Population and Development. Oxford Univ. Press.

Rhoda MM and Kabisa M.2016. Analysis of Indicators and Management Tools Used in Zambia to assess impact of Agricultural Extension Programmes on Gender Equity and Nutrition Outcomes. https://ingenaes.illinois.edu/wp-content/uploads/ING-DP-2016_12-Measuring-Impact-of - Tools-in-Zambia-on-G-and-N_IAPRI-Mofya-Mukuka-Kabisa.pdf

Sahoo RK and Tripathy SN. 2006. SHG and Women Empowerment. Anmol Publ.

Sinha K. 2000. Empowerment of Women in South Asia. Association of Management Development Institute in South Asia, Hyderabad.

Suggested Website

AESA- Agricultural Extension in South Asia– http://www.aesanetwork.org/

GFRAS- Global Forum for Rural Advisory Services– http://www.g-fras.org/en/

INGENAES- Integrating Gender and Nutrition within Agricultural Extension Services– https://www.agrilinks.org/activities/ingenaes-integrating-gender-and-nutrition-within-agricultural-extension-services

RRW- Reaching Rural Women– http://www.reachingruralwomen.org/

UN WOMEN– http://www.unwomen.org/en

SUPPORTING COURSES

Couse Code: STAT 0502

Credit Hours: 2+1

Course Title: Statistical Methods for Social Sciences

Objectives:

1. To lay the foundation of probability distributions and sampling distribution and sampling distributions and their application which forms the basis of statistical inference.
2. To have idea regarding different statistical methods with application in social sciences

3. To study the relationship of different socio-economic variables.

At the end of the course the students will be able to achieve the following outcomes:

Course Outcome

CO1: Comprehensive understanding of descriptive statistics and a wide range of probability distributions.

CO2: Handling complex probability distributions, including compound, truncated, and mixture distributions.

CO3: Gain knowledge of advanced statistical concepts such as random vectors, moments, and their distributions.

CO4: Interpret categorical data, perform log-linear modelling, analyse associations between attributes, and apply variance stabilizing transformations.

CO5: Proficient in order statistics, including the distribution of order statistics

CO-PSO Mapping:

	PSO1	PSO2	PSO3
CO1	✔		
CO2			✔
CO3			✔
CO4	✔		✔
CO5			✔

Theor

y

UNIT

I

Descriptive Statistics: Probability distributions**.** Discrete probability distributions: Bernoulli, Binomial Poisson, Negative binomial Geometric and Hyper Geometric, uniform, multinomial – Properties of their Distributions and real life examples. Continuous probability distributions: rectangular, exponential, Cauchy, normal gama Beta of two kinds, weibull, lognormal, logistic, Pareto, Properties of these distributions. Probability distributions of functions of random variables

UNIT II

Concepts of compound: Concepts of compound, truncated and mixture distributions definations and examples. Pearsonian curves and its various types. Sampling distributions of sample mean and sample variance from Normal population. Central and non-central chi-square, t and F distributions, their properties and inter relationships.

UNIT III

Random Vectors: Concepts of random vectors, moments and their distributions. Bivariate Normal distribution-mariginal and conditional distributions. Distribution of quadratic forms. Cochran theorem. Correlation, rank correlation correlation ratio and intra-class correlation. Regression analysis, partial and multiple correlation and regression

UNIT IV

Sampling distribution: Sampling distribution of correlation coefficient, regression coefficient, correlation ration, intra class correlation coefficient. Categorical data analysis- loglinear models, Association between attributes. Variance stabilizing transformations

UNIT V

Order statistics: Distribution of order statistics, joint distribution of order statistics and their functions, marginal distributions of order statistics, distribution range, median, etc. Revision and Doubt Clear

Practical

- Fitting of discrete distributions and test for goodness of fit: Binomial
- Fitting of discrete distributions and test for goodness of fit: Poisson
- Fitting of continuous distributions and test for goodness of fit: Normal
- Problems solving related to Binomial, Poisson and Normal distributions
- Fitting of truncated distribution
- Computation of simple, multiple and partial correlation coefficient
- Computation of correlation ratio
- Computation of intra class correlation
- Computation of simple and multiple regression coefficients and regression equations
- Fitting of pearsonian curves
- Problems solving related to simple, multiple partial correlation coefficient and regression coefficients
- Analysis of association between attributes
- Categorical data and log-linear models
- Revision and doubt clear

Suggested Reading

Agresti a. 2002, Categorical Data Analysis, 2nd Ed. John Wiley.
Arnold BC, Bakajrusgbab B &Bagaraha GB 1992, A First course in Order Statistics, Wiley
David HA &Nagaraja HN, 2003, Order, Statistics, 3rd Ed. John Wiley
Dudewiez EJ &Nusgra SBM 1988, Modern Mathematical Statistics , John Wiley
Huber PJ, Rabust Statistics, John Wiley
Johnson NL, Kotz S &Balakrishnan N. 2000, Continuous Univariate Distributions Wiley
Johnson NL, Kotz S &Balakrishnan N, 2000, Discrete Univariate Distributions, John Wiley
Marek F, 1963 Probability Theory and Mathematical Statistics, John wiley
Rao CR, 1965, Linear Statistical Inference and its Applications, John Wiley
Rohalgi,VK&saleh AK Md. E. 2005, An Introduction of Probability and Statistics John wiley.

Couse Code: EXTN

0541 Credit Hours: 3+0

Course Title: Computer Applications for Agri Extension Research

Objectives

1. To introduce students to various computer applications and software tools.
2. To teach students to collect, manage, and analyze agricultural data using computer software and statistical tools.
3. To introduce students to the Management Information System (MIS) and Decision Support System (DSS).

At the end of the course, the students will be able to achieve the following outcomes:

Course Outcomes

CO1: Develop practical skills in using computer applications and software tools.
CO2: Acquire the ability to collect, manage, and analyze agricultural data and interpret results effectively.
CO3: Gain knowledge of and adhere to ethical considerations when conducting agricultural extension research.
CO4: Understand the application of management information and decision support systems in agricultural contexts.
CO5: Comprehend e-business to plan, execute, and monitor agribusiness successfully.

CO-PSO Mapping:

	PSO1	PSO2	PSO3
CO1			✔
CO2			✔
CO3	✔		✔
CO4	✔	✔	✔
CO5			✔

Theory
UNIT
I
Concept of Computers: Brief History of Computers, Generation and Its Evolution, Characteristics of Computers, Main Areas of Computers and their Applications; Classification of Computers, Input-Output Devices, Memory Types (Cache, RAM, ROM), Memory Units,

UNIT II
Introduction to computer languages, Introduction to Operating Systems – Functions, Social Sciences: Agri-Extension Research**.** Features and Types, MS Windows and LINUX. Data Base Management System, MS Office (MS Word, MS Power Point, MS Excel, MS-Access and use of various management software Like SPSS, SAS etc.

UNIT III
The business value of internet, Intranet, extranet and Internet: Introduction to Web page design using HTML, Cloud Computing, Security and ethical challenges: Computer crime – Hacking, cyber theft, unauthorized use at work. Piracy – software and intellectual property. Health and Social Issues, Ergonomics and cyber terrorism.

UNIT IV

The concept of MIS: Definition, importance, Course Objective, prerequisites, advantages and challenges; Information Needs of organization, MIS and Decision – Making. Types/Classification of Information System for organizations; Introduction to Artificial Intellignce (AI), Neural Networks, Fuzzy logical control systems.

UNIT V

e-business/ e-commerce: e-business models, e-commerce processes, electronic payment systems, e-commerce trends with special reference to agri business. Applications of MIS in the areas of Human Resource Management, Financial. Management, Production/Operations Management, Materials Management, Marketing Management

Practical

- Laudon KC and Laudon JP. 2016. Management Information Systems- Managing the digital Firm, 14h Edition, Pearson India
- Turban, Volonino, Woods. Wali OP. 2015. Information Technology for Management, Advancing Sustainable, Profitable Business Growth, Wiley
- Jaiswal M and Mittal M. 2005. Management Information System, Oxford

Suggested Reading

Wilson, K., and Walker, J., (2018) Principles and Techniques of Biochemistry and Molecular Biology 8th
Edition, Cambridge University Press

Bonifacino, J. S., Dasso, M., Harford, J. B., Liipincott-Schwartz, J., and Yamada, K. M., (2004), ShortProtocols in Cell Biology. John Wiley & Sons, New Jersey

COMMON COURSES

Course Code: PGSS
0501 Credit Hours: 0+1
Course Title: Library and Information Services

Objective:

1. To equip the library users with skills to trace information from libraries efficiently.
2. To apprise students abou information and knowledge resources, to carry out literature survey.
3. To formulate information search strategies, with the application of modern tools.

Upon completion of the course the students will be able to achieve the following outcomes:

CO1: Acquaint with basic terms of library services
CO2: Understand the methods of tracing information from different source.
CO3: Develop ability to relate one information with another information of interest.
CO4: Gain knowledge on abstracts, review collection, citation, bibliography and tracking information.
CO 5: Comprehend ability to compose of review of literatures and scientific reports.

CO-PSO Mapping:

	PSO1	PSO2	PSO3
CO1			✔
CO2	✔	✔	
CO3	✔		✔
CO4			✔
CO5			✔

Practical

- Introduction to library and its services
- Role of libraries in education, research and technology transfer;
- Classification systems and organization of library
- Sources of information-Primary Sources, Secondary Sources and Tertiary SourcesIntricacies of abstracting and indexing services(Science Citation Index, BiologicalAbstracts, Chemical abstracts, CABI Abstracts, etc.)

- Tracing information from reference sources
- Literature survey; Citation techniques/Preparation of bibliography
- Use of CD-ROM Databases, Online Public Access Catalogue and other computerized library services
- Use of Internet including search engines and its resources
- E-resources access methods

Course Code: PGSS
0502 Credit Hours: 0+1
Course Title: Technical Writing and Communications Skills

Objective:

1. To equip the students/scholars with skills to write dissertations, research papers, etc.
2. To orient the students/scholars with skills to communicate and articulate in English (verbal as well as writing).
3. To familiarize the students on composing abstracts, review articles, research paper writing etc.

Upon completion of the course the students will be able to achieve the following outcomes:
CO1 Educate about the various forms of writings frequently required in a preparation of documents, reports, manuscripts, manual, etc.
CO2 Comprehend the principles and method of effective and professional communication and speech.
CO3 Acquire the ability to differentiate among and to use facts, inferences and judgments and editing and proof-reading and
CO4 Understand the organizing information for research communication, report, thesis and other publication
CO5 Develop the skills in composing the abstracts, content, notation, citation, captions, pagination, bibliography, review of literature, scientific manuscript, research article, review article, etc.

CO-PSO Mapping:

	PSO1	PSO2	PSO3
CO1			✔
CO2	✔	✔	✔
CO3			✔
CO4			✔
CO5			✔

Practical

- Technical Writing- Various forms of scientific writings- theses, technical papers, reviews, manuals, etc;
- Various parts of thesis and research communications (title page, authorship contents page, preface, introduction, review of literature, material and methods, experimental results and discussion)
- Writing of communication; illustrations, photographs and drawings with suitable captions; pagination, numbering of tables and illustrations

- Writing of numbers and dates in scientific write -ups; Editing and proof-reading;
- Writing of a review article. Communication Skills-Grammar(Tenses, parts of speech, clauses, punctuation marks); Error analysis(Common errors)
- Concord
- Collocation
- Phonetic symbols and transcription
- Accentual pattern: Weak forms in connected speech: Participation in group discussion: Facing an interview

- Presentation of scientific papers.

Suggested Reading

Chicago Manual of Style. 14thEd. 1996 Prentice Hall of IndiaCollins‘ Cobuild English Dictionary.1995
Harper Collins.Gordon HM & Walter JA. 1970.
Technical Writing 3rdEd. Holt, Rinehart &Winston‘abstracts, summaries, précis, citations etc.; commonly used abbreviations in the theses and research.

Course Code:
PGSS0503 Credit
Hours: 1+0
Course Title: Intellectual Property and Its Management in Agriculture

Objective:

1. To equip students and stakeholders with knowledge of intellectual property (IPR)
2. To give the significance into fundamentals of patient and copyright policy
3. To impart knowledge and biodiversity protection and initiatives

Upon completion of the course the students will be able to achieve the following outcomes:

CO1: Acquaint the meaning of intellectual property and differentiate it from tangible property.
CO2: Understand the process of IPR, their eligibility and various treaties and conventions.
CO3: Develop the ability to analyze TRIPs and various provisions in TRIPS Agreement, GI, ITK.
CO4: Comprehend protection of plant varieties, researcher’s right and farmers’ right.
CO5: Enable to evaluate ethical and professional issues that arise in the intellectual property law.

CO-PSO Mapping:

	PSO1	PSO2	PSO3
CO1	✔		
CO2			✔
CO3			✔
CO4	✔		
CO5		✔	✔

Theory

Historical perspectives and need for the introduction of Intellectual Property Right regime; TRIPs and various provisions in TRIPS Agreement; Intellectual Property and Intellectual Property Rights (IPR), benefits of securing IPRs; Indian Legislations for the protection of various types of Intellectual Properties; Fundamentals of patents, copyrights, geographical indications, designs and layout, trade secrets and traditional knowledge, trademarks, protection of plant varieties and farmers‘ rights and biodiversity protection; Protectable subject matters, protection in biotechnology protection of other biological materials, ownership and period of

protection; National Biodiversity protection initiatives; Convention on Biological Diversity; International Treaty on Plant Genetic Resources for Food and Agriculture; Licensing of technologies, Material transfer agreements, Research collaboration Agreement, License agreement.

Suggested Reading

Erbisch FH &Maredia K. 1998.Intellectual Property Rights in Agricultural Biotechnology.CABI.

Ganguli P. 2001. Intellectual Property Rights: Unleashing Knowledge Economy. McGraw-

Hill.
Intellectual Property Rights: Key to New Wealth Generation. 2001. NRDC & Aesthetic Technologies.

Course Code: PGSS
0504 Credit Hours: 0+1
Course Title: Basic Concepts in Laboratory Techniques

Objective:

1. To acquaint the students about the basics of commonly used techniques in laboratory.
2. To aware handling techniques and preparation of acid and bases.
3. To Learn seed viability testing tissue culture of plants and description of flowering plants

Upon completion of the course the students will be able to achieve the following outcomes:

CO1: Educate about basic rules and regulations of laboratory use
CO2: Acquaint with the principles and protocols of commonly used instruments in soil sciences. **CO3**: Comprehend the principles and methods of handling chemicals and equipment, preparation of solution, testing samples, etc. in the laboratory.
CO4: Acquire the skills to operate laboratory equipment efficiently and safely
CO5: Develop the ability to design appropriate procedure of scientific works in the laboratory in such a way that accuracy of results remains higher

CO-PSO Mapping:

	PSO1	PSO2	PSO3
CO1			✔
CO2			
CO3			
CO4			
CO5			✔

Practical

- Safety measures while in Lab; Handling of chemical substances
- Use of burettes, pipettes, measuring cylinders, flasks, separatory funnel, condensers, micropipettes and vaccupets; washing, drying and sterilization of glassware
- Drying of solvents/chemicals. Weighing and preparation of solutions of different strengths and their dilution
- Handling techniques of solutions; preparation of different agro-chemical doses in field and pot application
- Preparation of solutions of acids
- Neutralisation of acid and bases
- Preparation of buffers of different strengths and pH values.
- Use and handling of microscope, laminar flow, vacuum pumps, viscometer, thermometer, magnetic stirrer, micro-ovens, incubators, sandbath, waterbath, oilbath
- Electric wiring and earthing. Preparation of media and methods of sterilization
- Seed viability testing, testing of pollen viability
- Tissue culture of crop plants

- Description of flowering plants in botanical terms in relation to taxonomy.

Suggested Reading

Furr AK. 2000. CRC Hand Book of Laboratory Safety. CRC Press.
Gabb MH & Latchem WE. 1968. A Handbook of Laboratory Solutions. Chemical Publ. Co.

Course Code: PGSS
0505 Credit Hours: 0+1
Course Title: Agricultural Research, Research Ethics and Rural Development Programmes

Objectives:

1. To make the students aware about the organization and functioning of agricultural research systems.
2. To provide Knowledge and Skills to the students in agriculture research and research ethics.
3. To aware to the students about rural development through different government programs.

At the end of the course the students will be able to achieve the following outcomes: Course outcomes:

CO1: Understand the history of agriculture.

CO2: Comprehend the organization and functioning of agricultural research systems.

CO3: Learn about agriculture research and research ethics.

CO4: Gain knowledge on current rural developments programs through different government programs.

CO5: Know the critical evaluation of various rural development policies and programs.

CO-PSO Mapping:

	PSO1	PSO2	PSO3
CO1	✔		✔
CO2			✔
CO3	✔		✔
CO4	✔		
CO5	✔		✔

Theory

UNIT I

History of agriculture in brief; Global agricultural research system: need, scope, opportunitites; Role in promoting food security, reducing poverty and protecting the environment; National Agricultural Research Systems (NARS) and Regional Agricultural Research Institutions; Consultative Group on International Agricultural research(CGIAR): International Agricultural Research centres(IARC), partnership with NARS, role as a partner in the global agricultural research system, strengthening capacities at national and regional levels; International

fellowships for scientific mobility.

UNIT II

Research ethics: research integrity, research safety in laboratories, welfare of animals used in research, computer ethics, standards and problems in research ethics.

UNIT III

Concept and connotations of rural development, rural development policies and strategies. Rural development programmes: Community Development Programme, Intensive Agricultural District Programme, Special group- Area Specific Programme, Integrated Rural Development Programme(IRDP) Panchayati Raj Institutions, Co-operatives, Voluntary agencies/Non-

Governmental Organizations. Critical evaluation of rural development policies and programmes.Constraints in implementation of rural policies and programmes.

Suggested Reading

Bhalla GS & Singh G. 2001.Indian Agriculture- Four Decades of Development. Sage Publ.
Punia MS. Manual on International Research and Research Ethics. CCS, Haryana Agricultural University, Hisar.
Rao BSV. 2007. Rural Development Strategies and Role of Institutions- Issues, Innovations and Initiatives. Mittal Publ.