Xavier Institute of Natural Resource Management, Ahmednagar

Specialized Institute by Savitribai Phule Pune University

(Maharashtra University Act 2016, Section 111)

M.A. Natural Resource Management and Sustainable Development

(First Year, Syllabus NEP 2020)

Sr. No.	Credits Related to Major Core/Elective	Course	Course Name	Credit	Hours
			Semester I		
1	Major Core 10 T	NRM-1	Natural Resource Management.	4	60
2		NRM-2	Sustainable Development Perspectives	4	60
3		NRM-3	Socio, Eco & Political dimensions and NRM	2	30
4	Major Core 4 P	NRM-4	Field Practicum I	4	60
5	Major Elective 2 P	NRM-5	Water and Soil Testing Lab Practical 1 to 7	2	30
6	Major Elective 2 T	NRM-6	Water and Soil Testing Lab Practical 8 to 15	2	30
7	Research Methodology 4T	NRM-7	Research Methodology	4	60
				22	
			Semester II		
8	Major Core 10 T	NRM-8	Water, Soil, and Plants Resource Management	4	60
9		NRM-9	Sustainable Development Practices and Methods of Social Works	4	60
10		NRM-10	Development Administration and Good Governance	2	30
11	Major Core 4 P	NRM-11	Field Practicum II	4	60
12	Major Elective 2 T	NRM-12	Social Dynamics Actions & Movements	2	30
13	Major Elective 2 P	NRM-13	Development Administration and Good Governance	2	30
14	NRM (OJT) *	NRM-14	On Job Training	4	60
				22	

***On-the-Job Training (OJT)**

- Students will join an organization that offers the opportunity to gain experience.
- Students will work at least 60 hours and submit the reports.
- The OJT experience will be assessed by the supervisor in the field, the Center, the Director, and an external examiner.

Semester - I

NRM-1: Natural Resource Management, 4 credits: 4 T. 60 hours teaching

Objectives of the course:

This course helps to understand and learn about the nature and state of various natural resources. Ecosystems, Eco-equilibrium. Pollution and contamination of natural resources. Learning policies, laws, and programs by multiple stakeholders. Role of international agencies like UN, World Bank, IMF, GOI, State government, Local self-government, Policy framework, laws, Statutes, declarations, execution process, monitoring, and evaluation.

Module/ Unit 1:- (20 Lectures)

Understanding various natural resources such as Water, Soil, Air, Space, Energy, Forests, Plants, and Animals. Renewable and non-renewable natural resources and associated problems. a) Forest resources: Use and exploitation, deforestation, timber extraction, mining, dams, and their effectson forest and tribal people. b) Water resources: Use and over-utilization of surface and groundwater, floods, drought, conflicts over water, dam benefits, and problems. c) Mineral resources: Use and over-extraction of minerals and their effects on the environment. d) Food resources: Food security, modern agriculture and its impacts, chemical fertilizers-pesticide problems, waterlogging, salinity, and overgrazing. e) Energy resources: Growing energy needs, renewable and non-renewable energy sources, and use of alternative energy sources. f) Land resources: Land as a resource, land degradation, man-induced landslides, soil erosion, and desertification. Role of individuals in conservation and regeneration of natural resources, sustainable use of natural resources, and sustainable lifestyles.

References:-

Ajith, Sankar R.N- Environmental Management-Oxford University Press-2015(Evolution of Sustainable developmentconcept Ch1,Pp 7-18)

Asheem Srivastav& Suvira Srivastav "Ecological Meltdown – Impact of Unchecked Human Growth on the Earth's Natural Systems(Ch9,pp233-268)

Module /Unit 2: 10 lectures

Concept & Meaning of Ecology, Ecosystem, structure and functions of ecosystems; Producers- Consumers-Decomposers. Energy flow in the ecosystem, Ecological succession, Food chains, Food webs, Ecological pyramids- types, characteristics, structure, and function of the following ecosystem: -a. Forest ecosystem b. Grassland ecosystem. Desert ecosystem, Aquatic ecosystems.

References:-

Y P Abbi, Shashank Jain- Handbook on Energy Audit and Environment Management - Teri-2006(Energy)

K. Manikandan, S. Prabhu IFS- Indian Forestry (ed 4)- Jain Brothers-2015(Forest resources)

G.S. Sawhney- Nonconventional Energy Resources-P.H.I Learning Private Limited-2016(All chapters Nonconventional energy)

Module /Unit 3: 15 lectures

International agencies- UN, World Bank, WHO, WTO, and IMF. Collaborations on Natural Resource Management Policies, programs, guidelines, monitoring, evaluation,regulations, research, and development. Various international summits and achievements towards NRM. Stockholm Summit, Rio de Janeiro - Earth Summit, Kyoto Protocol, United Nations Framework Convention on Climate Change (UNFCCC), State Parties to reducegreenhouse gas emissions. Various institutions formed by the UN- United Nations Forum for Forest (UNFF), the United Nations Convention to Combat Desertification (UNCCD), the Convention on Biological Diversity, the United Nations Environment Program, COP26, and various conventions organized from time to time by the agencies.

References:-

Savindra Singh- Environmental Geography- Pravalika Publication Allahabad-2016(Ecology, Ecosystem Ch- 4,5pp46-66, Energy Ch-8pp 99-111)

Module/ Unit 4:- (15 Lectures)-

Execution agencies at the National, State, and grassroots levels. Role of various stakeholders in policy formation, laws, regulations, and executions. Center, States, Local Self Government (ZP,Block level agencies, Grampanchayat, Municipality, Corporation). Role towards the execution of Policies and programs, statutory duties, and responsibilities of agencies involved inpreserving and regenerating natural resources. National Green Tribunal (NGT), Fundamental Rights and Duties, Articles 48A, 51A(g), and 58A, and various Acts and Policies.

The Water (Prevention and Control of Pollution) Act – 1974, CESS ACT, 1977

The Air (Prevention and Control of Pollution) Act – 1981

Indian Forests Act (Revised) 1982. The Environment (Protection) Act, 1986, Proposedamendment 2019)

The Indian Wildlife (Protection) Act – 1972, amended in 1991

The Public Liability Insurance Act, 1991

The National Environmental Tribunal Act, 1995

The National Green Tribunal Act 2010

The Biological Diversity Act, 2002

National Environmental Policy-2004,

10 National Forest Policy-1988, Draft National Forest Policy 2018

11. National Water Policy-2012, 2017, National water policy and action for India 2020-part112.The Wildlife Life Protection Act 1972

13. Policies on Renewable and Non-renewable Energy Resources-14. CRZ regulations-2011, CRZ rules 2020

References:-

1. Eugene P. Odum- Ecology (ed 2)- Oxford And IBH Publisher-1970
2. Shankar IAS Academy- Environment (ed 4)- Shankar IAS Academy-2016
3. P.D. Sharma- Ecology And Environment (ed 12)- Rastogi Publication-2015
4. K. Manikandan, S. Prabhu IFS- Indian Forestry (ed 4)- Jain Brothers-2015
5. R. Rajagopalan- Environmental Studies From Crisis To Cure (ed 3)- Oxford University Press-2016
6. Dr. J.P. Sharma- Environmental Studies (For Undergraduate Courses (ed 4))-University Science Press-2017.
7. Jvs Murty- Watershed Management (ed 2)- New Age International Publishers-2013
8. Ajith, Sankar R.N- Environmental Management-Oxford University Press-2015
9. Abhijit Mitra, Tanmay Ray Chawdhari- Basic Of Environmental Science-New Central Book Agency-2017
10. Aulay Mackenzie, Andy S. Ball, Sonia R. Virdee- Ecology (ed 2)- Viva Books Private Limited-2002
11. G.S. Sawhney- Nonconventional Energy Resources-P.H.I Learning Private Limited-2016
12. D.P. Kothari, K.C Singal, Rakesh Ranjan- Renewable Energy Sources And Emerging Technologies (ed 2)- PHI Learning Private Limited Delhi-2014
13. S.R. Reddy- Irrigation Agronomy-Kalyani Publisher-2007
14. Eugene P. Odum, Gray W. Barrett- Fundamentals of Ecology (ed 5)- Cengage Learning-2005
15. Savindra Singh- Environmental Geography-Pravalika Publication, Allahabad, 2016
16. K.V. Krishnamurthy- An Advanced Textbook On Biodiversity-Oxford & IBH Publishing-2014
17. Y P Abbi, Shashank Jain- Handbook on Energy Audit and Environment Management - Teri-2006
18. Asheem Srivastav& Suvira Srivastav " Ecological Meltdown – Impact of Unchecked Human Growth on the Earth's Natural Systems" TERI, New Delhi

NRM-2:- Sustainable Development Perspectives. 4 credits, 4 T. 60 hours

Objectives of the course: - It is a foundational course that helps understand progressive evolution and the concept of 'Development' across various disciplines of knowledge, with particular reference to the world of human development in the present context. Theories, models, frameworks, concepts, and perspectives of development specifically reference the Ecologicalaspects of sustainable development. SDGs Agenda 2017-2030.

Module/unit No. 1:- 15 lectures (Concept of Development)

Concept of Development, Development theories (C.K Pralhad, Amartya Sen, empowerment frameworks, Development planning, various perspectives of development perspective, Economic perspective, social perspective, Industrial perspective, Welfare state,Sustainable Development. Global Development Challenges. Global North and Global South,various networks of nations and their agendas (G-8, SAARC), Human Development Reports,Sustainable Development Reports

References:-

H. M. Saxena- Environmental Geography (ed 3) - Rawat Publication-2017(Sustainable development ch.17pp261-270, Ch18-275-290, Ch-20-316-339,)

Savindra Singh- Environmental Geography-Pravalika Publication Allahabad-2016(Sustainable Development Ch23pp519-556)

Archana Sharma- Environment-Face The Challenge Academy-2016(Sustainable development goals (ChIX-pp-99-103)

Module /Unit No. 2:- 15 lectures (Indian Development planning process)

Development Planning, Policies and Programmes, Approaches - Five years of developmentplanning in India, Development planning process in India- Agricultural, Economic, Social welfare, Rural Development, Urban Development, Infrastructure development policies and programs, Stakeholders' role in planning, Indian development agencies- Constitution, GOI,State governments, Planning Commission, NITI Ayog in India, NGO and Private sector, IndianAdministration System and Civil Societies.

References:-

R.Rajagopalan- Environmental Studies From Crisis to Cure, 3rd edition- 2016(Ch3,4,5,6,7,8 -pp-33-124)

Rajesh K.Prasad, T.P. Ojha- Non Conventional Energy Source (ed 4)- Jain Brothers Publication-2014(Energy conventional and nonconventional)

D.P. Kothari, K.C Singal, Rakesh Ranjan- Renewable Energy Sources And Emerging Technologies (ed 2)- PHILearning Private Limited, Delhi-2014(Renewable energy resource)

Module/Unit No. 3:- 15 lectures (Role of International Development Organizations) Millennium Development Goals 2000-2015, Sustainable Development Goals- SDGs 2017-2030.

1-No Poverty 2- Zero Hunger and food security 3-Health 4-Education 5-Gender equality andwomen's empowerment 6-Water and Sanitation, 7-Energy 8-Economic Growth 9- Infrastructure,industrialization 10-Inequality 11-Cities 12-Sustainable consumption and production, 13- Climate Change14-Oceans 15-Biodiversity, forests, desertification 16-Peace, justice and stronginstitutions17-Partnerships. Achievements of SDGs in India. Review of reports of variousagencies on SDGs, Tools of measuring development – Indicators, Indices, Index.

References:-

H. M. Saxena- Environmental Geography (ed 3) - Rawat Publication-2017 Ch-3,4,5 pp-23-74) R.Rajagopalan- Environmental Studies From Crisis to Cure, 3rd edition- 2016(Ch3- pp23-42)

Module/ Unit No. 4:- 15 lectures (Methods of development practice)

Planning of Development programs, long-term and short-term programs, mapping and measuring development, training and capability building of stakeholders, building networks, advocacy, and collectives. People's Partnership, Public- Private -Partnership, Collectives, Action research, Pilot projects, role of innovations, and incubations.

References:-

1. Ananth Krishnan, T.N., 1999; Bioresources Ecology; Oxford IBH Publishing Company, New Delhi.
2. John G. Rau and David C. Wooten, University of California – Concepts of Environmental Impact Analysis Handbook 1980 –, McGraw-Hill Book Company, USA
3. WWF 1988; Conservation of Biological Diversity, a draft report, New Delhi.
4. Odum E P. Fundamentals of Ecology
5. Krishnamurthy K V (2003). An Advanced Textbook on Biodiversity – Principles and Practices. New Delhi: Oxford and IBH Publishing.
6. Caudhuri, A.B., and Sarkar, D. (2003). Megadiversity Conservation: Flora, Fauna, and Medicinal Plants of India's Hotspots. New Delhi: Daya Publishing House.
7. Forest Conservation Act 1980 (with Amendment in 1988)
8. Indian Forest Act (1878 and 1927)
9. R. N. Bhargava, Keith Olson, Lynn Tiede - Ecology and Environment -Teri2016
10. H. M. Saxena- Environmental Geography (ed 3) - Rawat Publication-2017

11. Lisa M.Benton, John Rennie Short-Environmental Discourses and Practice-Blackwell Publishers-2000
12. Remi Genevey, Rajendra K. Pachauri, Laurence Tubiana- Reducing Inequalities: A Sustainable Development Challenge-Teri
13. Prithwish Roy- Resource Studies-New Central Book Agency-2000
14. Archana Sharma- Environment-Face The Challenge Academy-2016
15. Dr. Punam Sharma, Dr. Rashmi Gupta- Environmental Science Paper 1 & 2-Arihant Publication
16. S.C. Santra- Environmental Science-New Central Book Agency-2016
17. K.P. Sagareiya- Forest & Forestry-National Book Trust , India-1967
18. Rajesh K.Prasad, T.P. Ojha- Non Conventional Energy Source (ed 4)- Jain Brothers-2014

NRM-3: Socio, Eco& Political dimensions and Natural Resource Management2 credits: 2 T. 30 hours of teaching

Objectives of the course: We live in a pluralistic society, and those influences our daily lives, so understanding it matters the most. Each society responds in its unique way. Concerns about natural resource management are also affected by the socio-economic and politicaldimensions of the places where communities live. Hence, it is vitalto understand these factors. Each discipline responds to its own, so it is imperative to comprehensively understand these from various fields, as far as NRM is concerned.

Module/ Unit 1:- (15 lectures) - Socio-Eco- context and Development

Understanding of basic concepts of Sociology- caste, creed, race, gender, culture, social structures, norms, deviation, discrimination, access, availability, affordability, Inclusion and Exclusion, Exploitation, Corruption, and social mobility. Social Development and Socio-economic and Political Indicators of Development. Environmental Sociology, Capitalism and Neoliberalization, Privatization and Globalization (LPG), States' Policies, Economics of Environment: Meaning, Nature, Scope and Significance, Common Property Resources: Accessand Control.

References

Nature and characteristics of social movements (Ref. No. 42, chapter 15, pp. 427-443) and how they contribute to and restrict social movements. (Ref No. 39, chapter 21, Pg. 611-624, Ref No. 42, chapter 15, pg. 427-443)

Environmental Movements, (Ref No. 42, chapter 15, pg. 427-443) (Ref No. 42, chapter 15, pg. 427-443) Literacy and Basic Education (Ref N0 44, chapter 23) Campaign, No. Women's Movements, (Ref No. 2, chapter 3, pg, 3-17.) Social movements and social change

Module/ Unit 2:- (15 lectures) Political dimension and Development –

Political systems- Power, Authority, Control, decision-making process, Government system, policies, law and order systems of society, rewards and punishment, leadership role, autonomy, governance, citizenship, and democracy. State, People, Citizens, Political parties, Peoples' Institutions, Political autonomy. Issues related to ownership of resources.

References

Concepts, processes, agents of social change, and theories of social change; (No. 42, chapter 15, pg. 417-426, No. 37, pg. 626- 629.) Social Structure and anomy; (No. 42, chapter 4, 5, 7) Conflict Theory, conformity and deviance (No. 42, chapter 6) Globalization and Change (No. 42, chapter 7)

NRM-4:- Field Practicum I. 4 credits: 4 P. 60 hours teaching.

A minimum of 10 visits of one day each will be coordinated among the course faculties, so that the present reality ca n be exposed to students based on classroom theoreticalinputs, grounded in learning through semester courses. This will fulfill the requirements for experiential learning and critical pedagogy. Each course will include components covering field exposures, s u c h a s communities, institutions, issues, and practices in real-life situations.

Objectives of the course: - Knowing and understanding the state of degradation of NRM, development-related issues, how development institutions respond to these issues through exposure visits, study tours to the villages, cities, communities, slums, experience of air, wind,rivers, lands, mountains, forest, mines, etc.

Total 4 modules/4 units (10 full-day visits and first-hand experience of the degradationof NRM). Methodology of fieldwork visits: The students will be divided into groups and given specific learning objectives. They will visit and study the state of degradation of natural resources in rural, tribal, and urban areas. They will visit specific locations, be exposed to the problems/challenges, etc., and analyze those circumstances after the visits through classroom discussions. They are expected to present a detailed plan of an intervention strategy to bring the required change or improvements. Further, they are encouraged to do group seminars and presentations. This will help students learn through direct exposure to various natural resources and hands-on experience. Moreover, it enhances their analytical, observational, documentation, field note-taking, and report-writing skills. This will help students to develop a real vision and scope of the concerned subject, i.e., NRM and Development. Apart from this, it helps develop skills for working in groups and the collective competence of each member.

NRM-5:- Soil and Water Testing Lab practical; 2 credits, 2 P. 30 Hours,

Major core 2

Objectives: - Professional technical skill development in theory and practical knowledge of the quality of water and soil testing technologies and processes.

Methodology: Actual practical works and learning the process of sample collections, labtesting methods, analysis, reading the results, documentation, report writing, counseling, and guidance for farmers for improvements.

Module1/Unit1:-

Water quality, water pollution, safe water, water contamination, water-related diseases, water purification process. Sample collection procedures, testing procedures, Test report preparation, validity of water testing reports, and Treatment and preventive measures. Water testing of basic eight parameters, pH, EC, Ca, Mg, P_2O_5, $CaCO_3$, HCO_3^-, SO_2, RSC, SAR.

Module 2/Unit 2:-

Soil pollution, sources of pollution, parameters of soil quality, soil health, components, and soilnutrients, soil analysis factors, methods of soil testing, procedure of sample collection, testing measures, report preparation, soil testing basic eight parameters, pH, EC, Mg, P_2O_5, $CaCO_3$, HCO_3^-,SO_2, MWHC, texture, moisture %.

Sr. No.	Practical Sessions
1	Properties of Water and Soil.
2	Determination of free CO_2 from the given water sample
3	To determine dissolved oxygen (DO) concentration in a given water sample using modified Winkler's method.
4	Determination of Phosphates from a given Water Sample.
5	Determination of Chlorides from the given water sample.
6	To determine the electrical conductivity (EC) of a given water sample.
7	To determine the pH of a given water sample by the electrometric method.

NRM-6:- Soil and Water Testing Lab practical; 2 credits, 2 T. 30 Hours

Major Elective

Module 1 Unit 1:-

The government system of water purification and safe drinking water. National Safe Drinking Water Mission, Government procedures, and system of assurance of safe drinking water

Module 2 Unit 2:- National Soil Health program, aims, objectives, programs, activities, impacts, challenges, and way forward—importance of organic soil, value oforganic natural resources, and farmers' capacity building.

Sr. No.	Practical Sessions
1	To determine different forms of Alkalinity in a given water sample by the titration method.
2	To study the collection and preservation of river/ dug well/ bore well water samples by the Random Sampling Method.
6	To determine the water sample's total hardness by the EDTA Titrimetric Method.
4	Determination of free Calcium Carbonate in soil by the rapid titration method.
5	To determine the total Nitrogen from the given sample by the Kjeldahl method.
6	To determine available Nitrogen from a given soil sample by the alkaline permanganate method.
7	Determination of available Potassium (K) from a given soil sample by Neutral N Ammonium Acetate Method.
8	Olsen's colorimetric method determines the available Phosphorus from the given sample.

NRM-7: Research Methodology (Qualitative, Quantitative, and Participatory Research Methods).

4 credits: 4 T. 60 hours teaching

Objectives of the course

To develop competency in doing research as a supportive method for enhancing the quality ofinterventions and finding the place for further improvements through scientific researchprocesses. This course will develop an understanding of three research methodologies: qualitative, quantitative, and participatory.

Module/ Unit 1(15 hours) Research a scientific inquiry

Research Methodology is the discipline of knowing the truth scientifically. Objectives and steps of research inquiry, research components, nature of research methodology, characteristics, process, assumptions, and values. The role and scope of research methods for decision-making, knowledge development, identifying

linkages between research and practice, the role of research in policy formation, and program planning, implementation, and evaluation.Research methodologies are qualitative, quantitative, and Action research.

Reference

Bryman Alan, Social Research Methods, Oxford University Press, 2012, (pp. 3- 154).)

Kumar Ranjit, Research Methodology, A step–by–step guide for beginners, SAGE Publications India Pvt. Ltd. 2015. (P-6)

Singh D K &Bhartiya A K, Social Work- Concepts and Methods, Published by New Royal Book Company, Lucknow, 2009.(pp-359-)

Module/ Unit 2:- (15 hours) The process of Quantitative Research:

Conceptualizing quantitative studies, problem identification and formulation, objectives, concepts, variables, hypotheses, and assumptions. (2) Designing quantitative studies: types of research designs and their scope; identification of data sources (primary and secondary). Methods and tools of data collection: observation, interviews, schedules, questionnaires, and community-based participatory methods and techniques. Selection of sample, random and non-random sampling methods, and sample size. (3) Data processing techniques: structuring and sorting data; tabular and graphic presentation of data; development of databases. (4) Analysis of data: levels of measurement (nominal, ordinal, interval, and ratio); descriptive statistics (percentages, measures of central tendencies – mean, median, and mode); measures of dispersion (range, mean deviation, standard deviation, use of SPSS); hypothesis testing (Chi-square test and t-test); interpretation of findings. (5) Reporting the results of quantitative research and identifying their linkages with the development of quantitative research studies.

Reference

Bryman Alan, Social Research Methods, Oxford University Press, 2012(pp. 157- 370)

Neuman Lawrence W. Social Research Methods, Qualitative and Quantitative Approaches, 2001,(pp. 106-172).)

Module/ Unit 3:- (15 hours) The Process of Qualitative Research:

(1) Conceptualizing qualitative studies: identifying the focus of the study, the areas of study, and lines of inquiry; (2) Designing qualitative studies: developing a research strategy, theoretical sampling, specifying the role of the researched and the researcher, and insider/outsider perspectives. (3) Methods of data collection: participant observation, lifehistories, in-depth/unstructured interviews, group interviews and focused group discussions, and community-based participatory methods and techniques. Principles of Triangulation aim to combine qualitative and quantitative methods to expand the scope of analysis in a particular research study (4). Data processing and analysis: preparing narrative data texts, developing coding categories, using matrices, and integrating findings to develop field-based conceptualizations. (5) Writing up qualitative studies:

insider/outsider perspectives, interactive process between the researcher and the researched, self-reflectivity, working towards developing field-based theory, planning and preparing proposalsfor qualitative studies.

Reference

Bryman Alan, Social Research Methods, Oxford University Press, 2012,(pp. 379-587).Bryman Alan, Social Research Methods, Oxford University Press, 2012, (pp. 692-706).

Neumann, Lawrence W. Social Research Methods, Qualitative and Quantitative Approaches, 2001, pp. 327- 439.)

Kothari C R & Garg Gaurav Research Methodology – Methods and Techniques, New Age International Publishers, New Delhi – 2014,(pp. 66)

Module/ Unit 4:- (15 Lectures) Community-Based Research process.

People know participatory Research methods- PRA–Definition, the logic of participation and the methodology of participatory rural appraisal, applications of PRA, Tools of PRA- Social mapping, Timeline, Wealth Ranking, Historical Diagram, Institutional Mapping, Group Dynamics, Focused Group Discussion, Social Network Analysis, Venn Diagram, Matrix Scoring, Transect walk, Micro level planning for Rural Development, Participatory rural appraisal technique, conducting Rapid Rural Appraisal.

References

Chambers, Robert, World Development Vol. 22, 1994, Pergamon, UK,(pp. 953 -969),

Book Ed. by Amitava Mukherjee, Participatory Rural Appraisal- Methods and Application in Rural planning, Vikas Publishing House Pvt. Ltd., Delhi, 1995(pp 1- 77).

Mukherjee Neela, Participatory Rural Appraisal, Concept Publishing Company, 2003,(pp 19 – 39, 88)

Chandra Ganesh, PRA, Issues and Tools for Social Science Research: Inland Fisheries. Central Inland Fisheries Research Institute, Bulletin 163. (pp 286-302.)

Mukherjee Neela, Participatory Rural Appraisal, Concept Publishing Company, 2003, (pp 19 – 39, 88)

Book Ed. by Amitava Mukherjee, Participatory Rural Appraisal- Methods and Application in Rural planning, Vikas Publishing House Pvt. Ltd., Delhi, 1995, (pp. 1- 77 Chandra Ganesh, PRA, Issues and Tools for Social Science Research Inland Fisheries. Central Inland Fisheries Research Institute, Bulletin 163. (p.- 286-302.)

References:-

- Ahuja, Ram (2001). Research Methods, Jaipur: Rawat Publications.
- Alston, M., Bocoles, W. (Indian Edition 2003) Research for Social Workers-An Introduction to Methods, Jaipur: Rawat Publications.
- Baker, Therese L. (1994). Doing Social Research, Singapore: McGraw-Hill
- Black, James A. & Champion, Dean J. (1976). Methods and Issues in Social Research, New York: John Wiley.
- Goode, W.J., Hatt, P.K. (1981). Methods in Social Research, Singapore: McGraw-Hill
- Grinnell, Richard M. (Jr.) (1988). Social Work Research and Evaluation, Illinois F. E. Peacock Pub. Inc. Jacob, K. K. (1965). Methods & Fields of Social Work in India, Bombay: Asia

Publishing.

- Kothari, C. R. (2004, 2nd edition, reprint). Research Methodology: Methods & Techniques, New Delhi, New Age International.
- Krishnaswamy, O. R. (1993). Methodology for Research in Social Science, Himalaya, Bombay.
- Laldas, D. K. (2000). Practice of Social Research, Jaipur: Rawat Publications.
- Mikkelsen, Britha (2005) Methods for Development Work and Research- A New Guide for Practitioners, New Delhi: Sage.
- Ramchandran, P. (1968). Social Work Research and Statistics, Bombay: Allied Publishers.
- Rubin, Allen &Babbie Earl (4th Ed. 2001) Research Methods for Social Work, USA: Wadsworth, West, Brooks/Cole, and Schirmer.
- Sarantakos, Sotirios (2005). Social Research, New York: Palgrave Macmillan.
- Sharma, B. A. V., Prasad, R. D. &Satyanarayana, C. (2002) Research Methods in Social Sciences, New Delhi: Sterling.
- Sharma, K. R. (2002). Research Methodology, Jaipur: National Publishing House.
- Wilkinson, T.S. &Bhandarkar, P. L. (1984). Methodology and Techniques of SocialResearch, Bombay: Himalaya.
- Young, Pauline (Asian students' edition, 1960). Scientific Social Surveys and Research, Japan: Asia Publishing House.

Semester - II

NRM-7:- Water, Soil, and Plants Resource Management 4 credits, 4 T. 60 hours teaching

Objectives of the course: Understanding various approaches, models, and strategies for water conservation and regeneration practices.

Module/ Unit 1:- (15 Lectures)

Water as a natural resource, elements of water, system, storage structures- ground level water sources, wells, bore wells, and surface level water sources, Rivers, Ponds, Dams,

Lakes, wetlands, and present practices of use and conservation, and analysis of them. Water tables, water pollution & water contamination, rainfall, rainwater harvesting, drought, and flood. National

water policy, Watershed management programs of different agencies, models, measures taken by various agencies to save water and save lives, National and international tribunals, treaties, water reservoirs, natural and man-made structures and efforts, waterrecharge technologies, water conflicts, and the political economy of water.

References

Water resources, availability of water resources, Elements of water, system (Ref. No. 33 chapter 11)) storage structures- ground level and surface level, present practices and analysis of it, water tables (Ref. No. 22, chapters 17-18)) water pollution & water contamination (Ref. No,33 chapter 17.), rainfall, rainwater harvesting, droughts, and management, (Ref.No, 22 chapter 16,) Watershed management programs of different agencies, models, majors taken by the various agencies, save water save life, National, international tribunes (Ref.N0.22, water reservoirs natural, man-made rivers, Ponds, Dams, wells, bore wells, Ponds, check weir, check dam, etc. (Ref.N0.22, chapters 17,18,19,20,)

Module/ Unit 2:- (15 Lectures)

Soil formation process, types of soils, structures of soil, components of soil, soil quality, degradation, soil erosion, the process of erosion, soil erosion rate, erosion measurement, soil conservation methods, CCTs, WAT, Farm bonding, Contour bonding, trenches, leveling, and terracing. Mulching, Plantation of trees and soil cover, farming methods, horticulture, irrigation, and soil fertility, the need and importance of organic soil.

References

Soil degradation (Ref. N0.22 chapter 26), soil erosion, erosion process- sun, water, wind, etc., soil erosion rate, erosion measurement Ref. No 22, chapter 3.) Soil conservation methods including CCTs, WAT, farm banding, trenches, leveling, and terraces. (Ref.N0.22.chapter 13) mulching,soil cover rating, soil conservation and farming methods, horticulture, irrigation, and soilfertility. Various government soil conservation programs. Ref. N0.22.chapters 11, 13)

Module/ Unit 3:- (15 Lectures)

Historical accounts of soil conservation programs implemented by government and other agencies, various methods and models of soil and water conservation- Ridge to Valley program, IGWDP, Jal-

swaraj, Hariyali, Jal-shivar, Vasundhara, IWMP. Government procedures for planning, implementation, and evaluation of watershed projects; roles of various agencies like government departments, Institutions like NABARD, Walmi, NGOs, and National/international tribunals.

References

Various methods, models of water conservation methods, Ridge to Valley program,(No.22 chapters 12, 16, 27) Vasundhara, IWMP, Jal-swaraj, Hariyali, Jal-shiver, etc., (Government literature/ website) Procedures of planning, implementation, and evaluation of watershed projects, the role of various agencies like government department, NABARD, Valmi Aurangabad, NGOs, National, international tribunes, (Ref. No.22 chapter 27)

Module/ Unit 4:- (15 Lectures)

Plants and types, native plants, Plantation and its relation to water conservation, soil conservation, plants and rain, climate change mitigation. Afforestation and forest development, social forestry, community forestry, urban forestry and biodiversity, Forest conservation methods and NRM, people participation, PPP model, and Plantation, and soil andwater conservation

Sustainability.

References

Plants and types ***(Ref. No. 6, chapter 1, No.9. Chapter 4)*** *Plantation and relation with water conservation, soil conservation, and climate change mitigation. Afforestation and forest development, social forestry, community forestry, urban forestry and biodiversity, Forest conservation methods and NRM, people participation, PPP model, and soil and water conservation.(Ref. No.22, chapter 27, Ref. No. 25, chapter 12, 7, 8)*

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2. H. M. Saxena- Environmental Geography (ed 3)- Rawat Publication-2017
3. Prithwish Roy- Resource Studies-New Central Book Agency-2000
4. S.C. Santra- Environmental Science-New Central Book Agency-2016
5. K.P. Sagareiya- Forest & Forestry-National Book Trust , India-1967
6. Dr. R. Suresh- Soil And Water Conservation Engineering-Standard Publishers Distributer's-

2014
7. P.D. Sharma- Ecology And Environment (ed 12)- Rastogi Publication-2015
8. Mahendra Singhpal- Recent Advances in Irrigation Water Management, Kalyani Publisher-2012
9. K. Manikandan, S. Prabhu IFS- Indian Forestry (ed 4)- Jain Brothers-2015
10. Jvs Murty- Watershed Management (ed 2)- New Age International Publishers, 2013
11. K.R. Chandhoke- Environmental Engineering and Disaster Management- Jain Brothers-2012
12. Aulay Mackenzie, Andy S. Ball, Sonia R. Virdee- Ecology (ed 2)- Viva Books Private Limited-2002
13. T.Yellamanda Reddy, G.H. Sunkara Reddy- Principals of Agronomy, Kalyani Publisher-2016
14. Savindra Singh- Environmental Geography-Pravalika Publication, Allahabad, 2016
15. The Forest Low-Low Publisher House.
16. Y P Abbi, Shashank Jain - Handbook on Energy Audit and Environment Management - Teri-2006
17. R. N. Bhargava, Keith Olson, Lynn Tiede- Ecology And Environment-Teri-2016
18. H. M. Saxena- Environmental Geography (ed 3)- Rawat Publication-2017
19. Prithwish Roy- Resource Studies-New Central Book Agency-2000
20. S.C. Santra- Environmental Science-New Central Book Agency-2016
21. K.P. Sagareiya- Forest & Forestry-National Book Trust , India-1967
22. Dr. R. Suresh- Soil And Water Conservation Engineering-Standard Publishers Distributer's-2014
23. P.D. Sharma- Ecology And Environment (ed 12)- Rastogi Publication-2015
24. Mahendra Singhpal- Recent Advances in Irrigation Water Management, Kalyani Publisher-2012
25. K. Manikandan, S. Prabhu IFS- Indian Forestry (ed 4)- Jain Brothers-2015
26. Jvs Murty- Watershed Management (ed 2)- New Age International Publishers, 2013
27. K.R. Chandhoke- Environmental Engineering and Disaster Management- Jain Brothers-2012
28. Aulay Mackenzie, Andy S. Ball, Sonia R. Virdee- Ecology (ed 2)- Viva Books Private Limited-2002
29. T.Yellamanda Reddy, G.H. Sunkara Reddy- Principals of Agronomy, Kalyani Publisher-2016
30. Savindra Singh- Environmental Geography-Pravalika Publication, Allahabad, 2016
31. The Forest Low-Low Publisher House.
32. Y P Abbi, Shashank Jain - Handbook on Energy Audit and Environment Management -

Teri-2006

33. Carla W. Montgomery, Environmental Geology, McGraw-Hill Education (India) Private Limited, New Delhi, 2016

NRM-9:- Development practices, NRM, and Methods of Social work 4 credits: 4 T. 60 hours teaching

Objectives of the course:

The social work professional discipline brings the desired change in the problem-solving process of life situations. Learning various methods of helping individuals, groups, communities, and institutions that require critical interventions toward conserving natural resources.

Module/Unit 1:- 15 hours teaching, Meaning of Social Work, Methods of the Social Work profession:

Introduction to social work practice, values of social work practice, methods of social work practice, working with Individuals and families, Groups, Communities, Social welfare administration, research, and social action.

Reference

Singh D K & Bhartiya A K, Social Work- Concepts and Methods, Published by New Royal Book Company, Lucknow, 2009(pp 1-397)

Bhattacharya Sanjay, Social Work: An Integrated Approach, Deep & Deep Publications Pvt. Ltd, Delhi, 2010,(p 1-107)

Module/ Unit 2:- (15 hours teaching) **Social Group Work Methods of Social Work- Work with Groups (Social Group Work) Understanding**

Concepts of Social Group Work and its importance in the human life cycle. Definition of Social Group Work, Characteristics of Social Group Work, History and Development of Social Group Work, Social Group Work Method, Group Work Process-Social group work in differentsettings. Types of groups in social group work practice- open and closed groups, socialtreatment groups (Re-socialization, groups, therapeutic groups, T-groups); task-oriented groups(forums, committees, and work teams); developmental groups (self-help groups and supportgroups). Steps in group formation: pre-group stage, orientationstage, problem-solving stage, termination stage. Role of the social worker in different stages ofgroup development**,** skills of Group practitioners, program planning, programimplementation**,** Group Process, Steps in understanding group process, analysis

of groupinteraction, leadership and its development in groups, communication in the group, Group dynamics- group bond, sub-groups, group conflict, confrontation, apathy, and group control.

Reference

Singh D K & Bhartiya A K, Social Work- Concepts and Methods, Published by New Royal Book Company,Lucknow, 200 (9p p- 176- 265).

Bhattacharya Sanjay, Social Work: An Integrated Approach, Deep & Deep Publications Pvt. Ltd, Delhi, 2010, (pp 267 – 316)

Module/ Unit 3: (- 15 hours teaching) Community Development practices

Community Organization and development, Concept of community, Community analysis, from a practitioner's perspective, Community Organization, community profile, history, definition, Community Organization as a political process – politics of participation, role of groups, leaders in community, Strategies of Community Organization; reflections on field experiences: problem analysis and community organization perspectives and models of Community organization.

Reference

Singh D K & Bhartiya A K, Social Work- Concepts and Methods, Published by New Royal Book Company, Lucknow, 2009(p 266- 329)

Bhattacharya Sanjay, Social Work - An Integrated Approach, Deep & Deep Publications Pvt. Ltd, Delhi, 2010(p 319 – 356)

Module/ Unit 4:- (15 Lectures)

Ideology and philosophy of people's participation, the democratic process of development, and ownership of the community. Participatory approach – participatory planning, implementation, monitoring, and evaluation. Methods of participation

–social action and social movements, local contribution, Shramdan, Various committees of VDC, SHG, User's group, people's involvement/ Forms of participation – resource contribution, labor contribution, time, etc., role of citizens' collectives and CBOs.

Bhattacharya Sanjay, Social Work -An Integrated Approach, Deep & Deep Publications Pvt. Ltd, Delhi, 2010, p 425 – 430.

Viegas Philip, Catalysts of a People's movement, in Social Activists and People's Movements Ed. by FernandesWalter, 1987, p 154.

Jadhav Jeewendra, Evangelization as Community Building, Social Center, Ahmednagar, 2006, pp. 143-147.

Verma K Manish, Globalization and Environment- Discourse, Policies and Practices, Rawat Publications, New Delhi, 2015, p 352-364.

Karl Marilee, Women, and Empowerment – Participation and decision making, Zed Books Ltd, USA, 1995, p 1-14.

References:-

Alinsky, Saul (1971). Rules for Radicals: A Practice Primer for Realistic Radicals, Vintage Books.

1) Bhattacharya, Sanjay. Social Work: An Integrated Approach. New Delhi: Deep & Deep Publications Pvt. Ltd.
2) Beher A & Samuel J (2006) Social Watch in India: Citizens Report on Governance and Development, Pune: NCAS
3) Berne, Eric (1966). Principles of Group Treatment. New York: Gnve Press
4) Boon Andrew & Book Andy (1999). Advocacy, USA: Cavendish Publications
5) Bradford (Ed.) (1964) T Group Theory & Laboratory Method, New York: John Wiley & Sons
6) Cartwright, Dorwin & Zandev, Alvin (1968) Group Dynamics, Research and Theory,London: Tavistock Publications
7) Chambers, Robert (2005). Ideas for Development, Earth Scan, London
8) Choudhary, Paul (1983). Introduction to Social Work, Delhi: Atma Ram & Sons
9) Corey, Geral (1977) Groups Process and Practice, USA: Brook/Cole Publishing Company
10) Cox, Fred (1987), Community organization, Michigan: F.E. Peacock Publishers
11) Dhama, O. P., & Bhatnagar, O.P. (1994). Education and Communication for Development. New Delhi: Oxford & IBG Pub. Co. Pvt; Ltd.
12) Douglas, Tom (1977) Group Work Practice, London: Tavistock Publications
13) Dunham Arthur (1962) Community Welfare Organization: Principles and Practice, New York: Thomas Crowell

14) Friedlander, W.A. (1978). Concepts and Methods in Social Work, Eaglewood Cliffs, NewDelhi: Bentice Hall International Inc.
15) Gangrade, K.D. (1971). Community Organization in India. Mumbai: Popular Prakashan.
16) Garland, J.A. Group Work: Reaching out, People, Places, and Power
17) Goel, S L & Kumar, Ram (2001) Disaster Management, New Delhi: Deep and Deep
18) Gravin, Charles D (1981). Contemporary Group Work, New Jersey: Prentice-Hard-ING
19) Gravin, Charles D., Lorraine M. Gulier (Ed.) (2007) A Handbook of Social Work withGroups, Rawat Publication
20) Heap, Ken 1(985) The Practices of Social Work with Groups- Systematic Approach, UK : George Allen & Unwin
21) IIED (1998) PLA Notes 31: Participatory Monitoring and Evaluation, InternationalInstitute of Education and Development
22) Indu Prakash (1994) Disaster Management: Societal Vulnerability to Natural Calamities,New Delhi: Rashtra Prahari Prakashan
23) Jha, Jainendra Kumar: Encyclopedia of Social Work, New Delhi: Anmol Publications Pvt. Ltd.
24) Khinduka, S. K., & Coughlin, Bernard (1965). Social Work in India, New Delhi: KitabMahal.
25) Milson Fred (1973) An Introduction to Community Work, Rutledge & Kegan Paul, NewDelhi: London OXFORD & IBH Publishing Co. Pvt. Ltd,
26) NCAS (2000) Fearless Minds: Rights-Based Approach to Organizing and Advocacy,Pune: National Center for Advocacy
27) PRIA (1995) Participatory Evaluation: Issues and Concerns, New Delhi: PRIA, Publications
28) Rao, MSA (1979) Social Movements in India, New Delhi: Vol. 1 and 2, Manohar,
29) Ross, Murray & Lappin, Ben (1967) Community Organization; Theory, Principles, andPractice, New York: Harper & Row.
30) Rothman Jack, Erlich John &Tropman John (1987). Strategies of Community Intervention: Strategies for Community Organization, Micro Practice, Michigan, F.E. Peacock Publishers.
31) Sanoff, Henry (2000) Community Participation Methods in Design and Planning, London : John Wiley and Sons.
32) Shaw, Martin E. (2nd Ed.) Group Dynamics, New Delhi: Tata – McGraw Hill Publishing

33) Srivastava, S. K. (1988). Social Movements for Development. Allahabad: Chugh Publications.
34) Siddique, H.Y. (1984). Social Work and Social Action, New Delhi: Harnam Publications.
35) Somesh Kumar (2002). Methods for Community Participation: A complete guide for practitioners. New Delhi: Sage Publications (Vistaar).
36) UNDP (2001). The Monitoring and Evaluation Framework, UNDP, Toronto: University of Toronto Press.
37) Vohra Gautam (1990). Altering structures: Innovative Experiments at the grassroots, Mumbai: Tata Institute of Social Sciences.
38) Warren Roland (1970). Studying Your Community, New York: A Free Press.
39) Wilson, Gertrude & Ryland, Gladys (1949) Social Group Work Practice, Haughton Mifflin Company

Recommended Journals

- Community Development Journal: An Alternative Forum, UK, Oxford University Press.
- Indian Journal of Social Work, Mumbai: Tata Institute of Social Sciences.

Social Action, A Quarterly Review of Social Trends and Social Action Trust, Delhi Seminar,New Delhi.

NRM 10:- Development Administration and Good Governance. 2 credits: 2 T. 30 hours

Objectives of the course: This course will deepen students' understanding of the formal administrative system of the government. Central, State, Regional, and local levels with special reference to Natural resource management and practices.

Module/ Unit 1:- (15 Lectures)

Concept of Administration, governance, Local, State, National level administration and governance, international governance. Institutions of governance, roles, Policies, programs, procedures, and implementations. Power, authority, role, and responsibility. Political leadership and the state government's governance procedures. Citizenship, role, and responsibility with development administration. Good governance and best governance practices; discipline; organizational behavior and culture; Public-Private Partnership concept and administration.

Reference

Leena Srivastava, (2014) Policy Intervention Analysis, Environmental Impact Assessment - Ritu Paliwal, Leena Srivastava

S.R. Maheshwari, (Ed. 6, 2013) Indian Administration, Orient BlackSwan, New Delhi

Module/ Unit 2:- (15 Lectures)

Parliament, legislature, judiciary, bureaucracy, and their roles, policy formulation, bill presentation, Task Force Groups, Indian Administrative Services, State Administrative Services, elected members and their role and governance, etc. Responsibility, accountability, and oriented administration.

Reference

S.R.Maheshwari, (Ed 6, 2013) Indian Administration, Orient BlackSwan, New Delhi, Leena Srivastava, (2014) Policy Intervention Analysis, Environmental Impact Assessment - Ritu Paliwal, Leena Srivastava

S.R. Maheshwari, (Ed. 6, 2013) Indian Administration, Orient BlackSwan, New Delhi

NRM-11:- Field Practicum II 4 credits: 4 P. 60 hours, project visits, and hands-on experience of water, soil, and plant conservationworks)

Objectives of the course:

Visiting different watersheds, water resource management programs, groundwater and surface water management, and conservation methods, learning the impacts of the projects, and applying classroom learning to the community/ village reality.

Module/ Unit 1, 2, 3, 4-

Fieldwork practicum and getting first-hand experience of the watershed, water conservation Methods, programs, and implementation strategies of soil and water conservation, community partnership, and other direct and indirect stakeholders. Students will be placed in villages for direct learning experiences with Social center-implemented projects, especially ongoing water conservation projects. A group of three/four students will be placed for fieldwork experience, equipped with hands-on training and skills for watershed development project management.

NRM- 12 Social Dynamics Actions & Movements, Credit 2, 2 T, 30 Hours

Module/ Unit 1:- (15 lectures) Social Change and Actions, Movements

Concepts, processes, agents of change, and theories of social, economic, and political change. Social structure and anomy, Conflict theory, conformity and deviance, polarization, Globalization, etc. Social Change, actions and movements- Nature and characteristics of social movements,

Stakeholders of Social Change, leadership, followers, Stakeholders of social movements, contributing and restricting social movements.

References

Leena Srivastava, (2014) Policy Intervention Analysis, Environmental Impact Assessment - RituPaliwal, Leena Srivastava

S.R.Maheshwari, (Ed. 6, 2013) Indian Administration, Orient Black Swan, New Delhi

Sanjay Bhattacharya, Social Welfare Administration, Deep& Deep Publication, New Delhi.361-401

Module Unit 2- (15 lectures) Social Change Agents

Agents of change: Individuals, NGOs, Governments, Scientific Research Institutions, Policies, Programs, Activities, Communication, and Media. Case studies, Documentaries, Books, Films. Environmental movements, Literacy Campaigns, Education, and movement. Women's Movements, Dalit movement, Human Rights movement.

NRM 13:- Development Administration and Good Governance. 2 credits, 2 P, 30 hours

Module/ Unit 1:- (15 Lectures)

Various Acts and their implementation procedures, policies, programs, and executive bodies**.** National Rural Health Mission, National Rural Livelihood Mission, administration ofnational programs concerned with NRM, e.g., forest, marine, agriculture, environment, pollution control, law and order execution, and administration processes.

Module/ Unit 2:- (15)

Visits to various institutions and government departments to learn the system and interactions with administration. (Guest lecturers and practitioners from NGOs to make casestudy presentations.)

NRM 14:- On Job Training (OJT)

Land surveying and development 4 credits and 4 units 60 hours

Objectives of the courses:- Classroom theory inputs and an equal amount of actual practical And the practice of land surveying methods and the technological application of the skills Development

Methodology: - Classroom theoretical inputs, but primarily actual skill and competencies development by surveying, using various instruments effectively while surveying, and preparing maps and drawings. Land space mapping.

Module 1 /Unit 1:-(Land as a resource) Land as a resource, land-use pattern, land **c**onflicts, survey, revenue records, services, various land ownership laws, documents, etc.

Module 2 /Unit 2 :-(Theory) How to survey the land, Technologies and tools for surveying, measurement tools, machinery use, Methodology of surveying, types of surveying, Free Station Surveys, Tie distance, Road Design & Stakeout, Area (Plan), Remote Height, Computation (COGO), Reference Line, Longitudinal & Traverse Profiles, Contour Map, Cross Section, Cut and fill volumes, Lis CAD, Auto Plotter, Road Estimator

Module 3 /Unit 3:- (**Practical Session)** Column alignments and column set-out, Stakeout pile points with reference to an existing structure, establishing new benchmarks and cross-checking, Layout pipelines and marking inverted levels, Layout points for storage tanks, Layout transmission lines and bolt fixing, Set out octagons, hexagons, circles, etc.

Module 4/ Unit 4:- Various Software – Design-related software, AutoCAD, 2D, 3D, and supporting backup software, etc**.** Practical on job training with government and private certified surveyors, Preparing Survey Reports to International Standards and requirements, drawing maps, and mapping methods. Government standards in India for the same.