

Activities of the Department

Education

Courses Offered from the Department at Graduate level		
Course code	Title of Course	Credits
NRMF.1.1	Fundamentals of Geology and Soil Science	2 + 1
NRMF.1.2	Agro-meteorology	2 + 1
NRMF.2.1	Principals of Hydrology, Soil & Water Conservation	1+ 1
NRMF.2.4	Chemistry and Fertility of Forest Soils	2 + 1
SAF 2.4	Environmental Science	2 + 1
NRMF.3.1	Soil Survey, Remote Sensing and Wasteland Development	2 + 1
NRMF.3.2	Forest Engineering	1 + 1
NRMF.3.3	Organic Farming	1 + 1
NRMF.5.1	Rangeland Management	2 + 1
NRMF.5.2	Forest Business Management	1 + 1
NRMF.5.3	Principles of Forest Economics, Project Planning and Evaluation	1 + 1
NRMF.6.1	Forest Management, Policy and Legislation	2 + 1
NRMF.6.2	Marketing and Trade of Forest Produce	2 + 1
FBT 4.2	Fundamentals of Wild Life	2 + 0
FBT 5.1	Wild Life Management	1 + 1
NRMH 1.1	Fundamentals of Soil Science	1 + 1
NRMH 2.2	Soil Fertility and Nutrient Management	1 + 1
Courses Offered from the Department at Post Graduate level		
Course code	Title of Course	Credits
WM 521	Watershed concepts, project formulation and planning	2 + 1
WM 522	Application of Remote Sensing and GIS in Watershed Management	1 + 1
WM 523	Watershed Survey, Mapping and Structural Engineering Designs	2 + 1
WM 524	Watershed Hydrology and Resource Conservation	2 + 1
WM 525	Production System and Bio - diversity in Watershed	3 + 1
WM 526	Peoples Participation and Impact Analysis in Watershed	2 + 1
FOR 612	Land use Planning and Watershed Management	1 + 1
PGS 506	Disaster Management	1 + 0
AF 522	Soil and Water Management in Agro forestry	1 + 1

PG (M. Sc Forestry) Students graduated from the department - 03

PG Thesis submitted

Sr. No.	Student's Name	Major Guide	Thesis Title	Faculty	Specialization	Degree award in the year
1	Surendra Kumar	P K Shrivastava	Evaluation of farm pond constructed in campus, watershed, 95 p	Forestry	Watershed Management	2012
2	Revale Amit Ankush	K G Patel	Natural resource characterization of Vanarasi area, 110 p	Forestry	Watershed Management	2012
3	Surve Nilam Vijay	P K Shrivastava	Evaluation of changes in micro watersheds of NAU campus during last decade, 88 p	Forestry	Watershed Management	2013

Research

Research Project of the Department			
Sr. No.	Title of project	Type	Agency
1	Establishment of Center on Environmental Studies. B.H- 12950	Plan	GOG
2	Strategies to Mitigate the Impact of Climate Change, Navsari. B.H- 12019	Plan	GOG
3	Development of methodology for identification and discrimination of biotic stress in <i>Tectona grandis</i> L.” B.H. No. 19113	Other agency	DST

On going Departmental research Studies	
Sr. No.	Title of project
1	Study the impact of weather changes on the major crops of the region
2	Assessment of Land use / Land cover Changes In South Gujarat Using Remote Sensing And Geographical Information System
3	Study the impact of weather changes on the major crops of the region
4	Study the temporal and spatial changes in water quality of NAU Campus
5	Effect of different cropping systems on physicochemical and biological properties of soils.
6	Effect of different salinity levels of irrigation water on young teak plants.

7	Effect of different salinity levels of irrigation water on clones of <i>Casuarina equisetifolia</i>
8	Development of integrated rainwater resource management (iRaM) module for Coastal areas of South Gujarat
9	Feasibility study to assess the use of recycled grey water for irrigation
10	Estimation of Green House Gases (GHGs) emission from paddy fields
11	Assessment of impacts of air pollution on Mango
12	The economic impact of climate change

Recommendations / Concluded Studies

Sr. No.	Recommendation	Approved In															
1	<p>Pitcher irrigation in young mango plants</p> <p>The farmers of AES– II of South Gujarat heavy rainfall zone are advised to adopt pitcher method of irrigation in newly planted mango orchard. They are recommended to fill either 1 pitcher of 10 L capacity or 2 pitchers of 7 L capacity per week, resulting in 50 % and 30 % water saving respectively, as compared to ring method of irrigation.</p>	III, Combined Joint Agresco, 2007															
2	<p>Percolation pit for clay soils of South Gujarat</p> <p>The farmers of coastal areas of South Gujarat are recommended to construct a percolation pit near their bore well, in the available natural depression/monsoon drain. The pit of size 4.0 m x 3.0 m x 2.0 m (for a field of about 2 ha) along with 200 mm PVC strainer pipe, inserted before digging the pit upto first aquifer (about 12 m depth) for improving the ground water quality. The pipe should be about 0.6 m above ground with cap on top.</p>	VI, Combined Joint Agresco, 2010															
3.	<p>Rain Water Harvesting for sustaining ground water quality in coastal South Gujarat</p> <p>Farmers of the South Gujarat coastal region are recommended to harvest as much rain water as possible to maintain ground water quality below (EC=2 dS/m) as per catchment area as tabulated below. The suggested modes of harvesting in decreasing order of preference could be Pond, Check dam, Percolation pit, Percolation well, Trenches and Sub soiling, as per availability of land, catchment area, water demands, financial capacity, topography, rainfall pattern, soil type, vegetative cover and nearness to sea</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th style="text-align: center;">Sr.No</th> <th style="text-align: center;">Area (ha)</th> <th style="text-align: center;">Mode of Harvesting</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">1</td> <td style="text-align: center;">> 2</td> <td style="text-align: center;">Pond & Check Dam</td> </tr> <tr> <td style="text-align: center;">2</td> <td style="text-align: center;">2 to 1</td> <td style="text-align: center;">Percolation pit</td> </tr> <tr> <td style="text-align: center;">3</td> <td style="text-align: center;">1 to 2</td> <td style="text-align: center;">Percolation well</td> </tr> <tr> <td style="text-align: center;">4</td> <td style="text-align: center;">< 0.5</td> <td style="text-align: center;">Trenches & Sub soiling</td> </tr> </tbody> </table>	Sr.No	Area (ha)	Mode of Harvesting	1	> 2	Pond & Check Dam	2	2 to 1	Percolation pit	3	1 to 2	Percolation well	4	< 0.5	Trenches & Sub soiling	VIII Combined Joint Agresco, 2012
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2	2 to 1	Percolation pit															
3	1 to 2	Percolation well															
4	< 0.5	Trenches & Sub soiling															

4	<p>Time series analysis of weather parameters in relation to crop productivity Scientific Community The monsoon onset is delayed by a week and recedes a week early. Higher evaporation of 8 % and 18 % were observed during summer and rabi seasons respectively Therefore, scientists are recommended to Evolve shorter duration crop varieties suitable for delayed monsoon and Reassess the crop water requirements for South Gujarat region.</p>	VIII Combined Joint Agresco, 2012
5	<p>Roof top rain water harvesting for potable use Roof top rain water harvesting for potable use is recommended. Storage capacity of tank should be approximately 1000 L/capita/yr., constructed in such a way that no light or air enters inside to prevent bacterial growth and the tank may at least 0.5 m above ground level to prevent direct entry of runoff water. Water from the tank could be pumped out by means of hand pump or electric operated self priming shallow lift pump.</p> <p>Precautions to be adopted are:</p> <ul style="list-style-type: none"> ➤ Roof tops and conveyance pipes should be thoroughly cleaned at the time of onset of monsoon. First flush of rain water should be allowed to bypass the storage tank, as well as during long gaps between two rainy events. ➤ Roof water may be allowed to pass through gravel – sand filter, consisting of layers (30 -50 cm) of coarse sand, 25 mm gravel, 50 mm gravel to remove organic impurity. ➤ Calcium Carbonate powder kept in earthen pots (7 L capacity / 5000 L), tied with muslin cloth on the mouth may be submerged into the storage tank. ➤ Walls of tank could be white washed with lime solution. ➤ Anaerobic bacteria may develop with time which could be removed by boiling / adding 0.5 g tablet of chlorine in 20 L of water / storage of water in copper vessel for 8 – 10 hrs / by using commercially available UV filter. 	X Combined Joint Agresco, 2014
6	<p>Disinfecting drinking water against any microbial activity by storing water in a copper vessel To disinfect drinking water against any microbial activity, water could be safely stored in a copper vessel for 12 hrs and 24 h to reduce Total Coliform by 85% and 90 % and total bacterial count by 67 and 81 % respectively.</p>	X Combined Joint Agresco, 2014

7	<p>Study on influence of different temperature regimes on growth and yield of rice</p> <p>On the basis of two season experiment in controlled environmental conditions, it is recommended that there is need to develop new rice varieties in context of future global warming. The significant yield reduction was recorded in all the three rice varieties viz. Jaya, Gurjari and GNR-2. The yield reduction was up to the tune of 18% and 36.6% when rice crop experienced rise of only 1.3°C and 2.7°C respectively, in average daily temperature above 10 years of average temperature.</p>	X Combined Joint Agresco, 2014
8	<p>Rainfall based crop planning for Dediapada</p> <ol style="list-style-type: none"> 1) Farmers of Dediapada taluka are recommended to proceed for sowing operations from 27th SMW. 2) Farmers are advised for in-situ moisture conservation and runoff collection in ponds for providing supplemental irrigation at the critical stages of rainfed crops after withdrawal of rainfall i.e. 36th SMW to get maximum production form rainfed crops. <p>Scientific Community</p> <ol style="list-style-type: none"> 1. 27th SMW receives 24 mm, 26 mm and 35 mm rainfall amount at 75 %, 71 % and 60% probability respectively. 2. The length of monsoon season is 112, 105 and 70 days at 50 %, 60 % and 75 % probability respectively. 3. Rainfall is withdrawn after 39th, 38th and 36th SMW at 50 %, 60 % and 75 % probability respectively. 4. There are 60 and 75 % probability to get sufficient rainfall for rainfed crops (> 10 mm) for continuous 11 SMW (77 days) from 27th to 37th week and 10 SMW (70 days) from 27th to 36th week respectively. 	X Combined Joint Agresco, 2014
9	<p>Assessment of pollution tolerance index of some plants</p> <p>In industrial areas of tropical region, it is recommended to plant Forest specie <i>Cassia fistula</i>, as it showed maximum APTI value as compared to other species. In addition, species <i>S. indica</i> and <i>S. cumini</i> are also found to be tolerant for plantation in industrial areas.</p>	X Combined Joint Agresco, 2014

Papers Published (2010 onwards):

1. Parmar V. R. and Shrivastava, P. K.,. (2009) Variability of temperature in South Gujarat coast, Journal of Agrometeorology, Vol. 11 (Special Issue) : 204-207
2. Nayak, D., Behera, L.K. and Jadeja, D.B. (2010). Genetic diversity among different seed sources of *Jatropha curcas* Linn. Green Farming 3(1): 16-19.
3. Shrivastava P. K, Patel B. N. and Patel, S. N. (2010) Pitcher irrigation for young mango plantation in water scarce hilly tracts of South Gujarat, Indian J. Hort. 67 (Special Issue), November 2010: 436-438

4. Poonam, D. Nayak, Rajan Bawa and Tara Gupta. 2011. Agroforestry systems of Lahaul and Spitti district of Himachal Pradesh, Western Himalaya. *Indian J. Ecology*.38 (special issue): 129 -131.
5. Prajapati, V.M., N.S. Patil, B.G. Vashi, D.B. Jadeja and D. Nayak (2011). Performance of *Curcuma longa* L. grown as intercrop under different tree species, *J. Non-Timber Forest Product* Vol.18 (4): 285-288.
6. Tripathi, Sonal, Patel, H M, Shrivastava P K, and Bafna A M (2011) An assessment of ground water quality of eighteen selected locations of South Gujarat, *Indian J. Environ. & Ecoplan.* 18 (1) : 177-184
7. V.K. Solanki, M.U. Kuakadia, D. Nayak and S. Jha. (2011). Effect of different plant growth regulators on sprouting in cuttings of Khair (*Acacia catechu wild.*), *J. Tropical Forestry*, Vol. 27(II): 30-33.
8. Nayak, D., Behera, L.K., Prajapati, V.M. and Jadeja, D.B. (2012). Genetic variability in seed and seedling traits of *J. curcas* L. *J. Non-Timber Forest Product* Vol.19 (2): 111-116.
9. P. K. Shrivastava, A. M. Patel and D P Patel (2012) Rain Water Harvesting in Navsari Agricultural University Campus – a case Study, Full length Paper published in Proceedings of National Consultation Meeting on “Application Technologies for Harvested Rainwater in Ponds”, organized by Central Research Institute for Dry land Agriculture (CRIDA), ICAR, Hyderabad, Mar.19 – 20, 2012
10. Parmar V. R., Shrivastava, P. K., and Patel B. N. (2012) Study on weather parameters affecting the mango flowering in south Gujarat, *Journal of Agrometeorology*, Vol. 14 (Special Issue) : 351 -353.
11. Arvadiya L.K., Raj V. C., Patel T.U., Arvadia M.K., and Patel A.M. (2012) Effect of plant population and weed management practices on productivity of sweet corn, *Indian Jr. Weed Sci.* 44(3):167-171
12. VM Prajapti, Sushil Kumar, D. Nayak and MR Parmar (2012). Toxicity of various *Bacillus thuringiensis* (Bt.) doses on teak defoliator (*Hyblea puera*) under laboratory conditions. *Annals of Forestry*, Vol. 20 (2): 175-179.
13. Patel Darshana, Shrivastava, P. K., and Patel D. P. (2013) Study on Noise pollution in Navsari city of South Gujarat, *Journal of Environmental Research and Development*, Vol. 8 (2) : 291 - 298
14. Patel T.U., Thanki J. D., Patel D.D., Arvadiya L.K., Italiya A.P. (2013) Weed management, fertilizer application and productivity of onion (*Allium cepa*) Bulbs, *Bioinfolet* 10(2a):379-381.
15. Arvadiya L.K., Raj V. C., Patel T. U., Arvadia M. K., Naik V.K. (2013) Productivity of sweet corn (*Zea mays*) as influenced by plant population and weed management, *Bioinfolet* 10(2a):382-384.
16. Arvadiya L.K., Raj V. C., Patel T.U., Arvadia M.K., and Thanki J.D. (2013) Productivity and economics of sweet corn (*Zea mays*) as influence by planting geometry and weed management, *Res. on crops* 14(3): 748-752
17. Shailendra Bhalawe, M.U. Kukadia and Dileswar Nayak (2013). Nutrient release pattern of decomposited leaf litter in different multipurpose trees, *Indian Forester*, 139 (3) : 212-217.
18. Shailendra Bhalawe, D. Nayak, MU Kukadia and Paresw Gaykwad (2013). Leaf litter decomposition pattern of trees, *Bioscan* 8(4): 1135-1140.

19. Shailendra Bhalawe, D.B. Jadeja, M.B. Tandel, P. Gayakvad and D. Nayak (2014). Atmospheric carbon capturing potential of block plantations, *Res. Environ. Life Sci.* 7(1): 31-36.
20. Paresh Gayakvad, D.B. Jadeja, B. Thakre, S. Bhalawe and D. Nayak (2014). Ethno-veterinary medicinal plants of mahal village of dang district, Gujarat, India, *Res. Environ. Life Sci.* 7(2): 99-100.

Manual / Reports (2010 onwards):

1. Dileswar Nayak and P. K. Shrivastava (2010) Status Report of Establishment of Center on Environmental Studies, Dept. NRM, ASPEE College of Horticulture & Forestry, NAU, Navsari: 37 p
2. Vyas H U and Shrivastava P K (2012) Comprehensive District Agriculture Plan (C-DAP), District Surat, Department of Agriculture & Cooperation, GOG, Gandhinagar : 197 p
3. Shrivastava P K and Sarika Santu Wandre (2013) Design and Planning of Rain Water Harvesting Structures for University Farms at Bharuch, Department of Natural Resource Management, ASPEE College of Horticulture & Forestry, Navsari Agricultural University, Navsari : 39 p
4. Shrivastava P K and Sarika Santu Wandre (2013) Design and Planning of Farm Pond for Tanchha Research Station, Department of Natural Resource Management, ASPEE College of Horticulture & Forestry, Navsari Agricultural University, Navsari : 10 p
5. Dileswar Nayak and P. K. Shrivastava (2013) Manual on Remote Sensing and GIS, Department of NRM, ACHF, Navsari Agricultural University, Navsari : 88 p

Book Chapter:

1. Nayak, D., Patil, N.S., Jha, S.K. and Jadeja, D.B. (2012). Gamma rays induced variability in *Jatropha curcas* L., in Daniel, M. and Arya, Arun (ed.) *Phytotechnology: Emerging trends*, Scientific Publishers, Jodhpur (India). Pp. 248-252.

Book:

1. Shailendra Bhalawe, Paresh Gaykwad and Dileswar Nayak, (2012). Nutrient release pattern in decomposition of multipurpose trees, Lambert Academic Publication. The Netherland. Pp. 87.

Papers Presented (2010 onwards):

1. Shrivastava, P. K., Kaleriya, K. A., Parmar, Vipul and Patil R.G. (2010) Time Series Analysis of Temperature Variations and its Impact on Sugarcane Crop, National Symposium on Climate Change and Rainfed Agriculture, Organized by Central Research Institute for Dryland Agriculture at Hyderabad from February 18 - 20, 2010: p 88- 90
2. Shrivastava P K. (2010) Groundwater Management under high water table conditions, Compendium Winter School on Water Resources Management in Coastal Area for Enhancing Water Productivity, Oct. 11-31, 2010, Organized by Soil and Water Engineering Department, College of Agricultural Engineering and Technology, JAU, Junagadh : 283-289
3. Shrivastava P K. (2010) Drainage of water logged clay soils Compendium Winter School on Water Resources Management in Coastal Area for Enhancing Water

- Productivity, Oct. 11-31, 2010, Organized by Soil and Water Engineering Department, College of Agricultural Engineering and Technology, JAU, Junagadh : 290 – 300
4. Darshana Patel and P.K.Shrivastava (2011) Study on Noise pollution in Navsari city of South Gujarat, 4th International Conference of Environmental Research, Organized at Sardar Vallabhbhai National Institute of Technology, Surat, Dec. 14-17, 2011: p 191
 5. P.K.Shrivastava (2011), Initiatives to Study the Impact of Climate Change on Agriculture, Nation level capacity building workshop – Promoting Eco Agriculture for Sustainability & Climate Change Impact Management”, organized by Mumbai University, Mumbai, Dec. 19-20, 2011
 6. P. K. Shrivastava, A. M. Patel and D P Patel (2012) Rain Water Harvesting in Navsari Agricultural University Campus – a case Study, Paper presented in National Consultation on “Application Technologies for Harvested Rainwater in Ponds”, organized by Central Research Institute for Dry land Agriculture (CRIDA), ICAR, Hyderabad, Mar.19 – 20, 2012
 7. Shrivastava, P. K. (2012) Water Management Action Plan at District Level for Climate Resilient Agriculture, Paper presented in National Workshop on “Micro Level Action Plan at District Level for Climate Resilient Agriculture”, organized by AAU, Anand, NCCSD, Ahmedabad, ICAR, and Planning Commission, Jun. 29-30, 2012
 8. Sarika Santu Wandre, Nilam Vijay Surve, Dileshwar Naik and P.K. Shrivastava (2013) Remote Sensing and GIS in Horticulture: Opportunities and Challenges, Organized at NAU Navsari from Jan. 9-11, 2013
 9. Shrivastava P. K., A. M. Patel and D P Patel (2013) Rain Water Harvesting in Navsari Agricultural University Campus – a case Study, 47th Annual Convention of ISAE and International Symposium on “Bio Energy – Challenges and Opportunities”, Jan. 28 – 30, Hyderabad
 10. Shrivastava,P.K. (2013) Environmental Status of Navsari – A perspective, Presentation in one day workshop on “Urban Environmental Governance – A Vision for Navsari & Vijalpore” at NAU Navsari in collaboration with University of Lausanne.
 11. Shrivastava,P.K. (2013) Impact of Climate Change on Horticultural Crops, Lecture deliver on Dec. 5, 201, in Winter School on “Current Trends in Commercial Horticulture” from Dec. 1 to 21, 2013, at ASPEE College of Horticulture and Forestry, Navsari Agricultural University, Navsari, Sponsored by ICAR :
 12. Shrivastava,P.K. (2013) Water Recycling and Management in Urban Areas, Lecture deliver in National Workshop on “Urban and Periurban Horticulture” on Dec. 21, 2013, at ASPEE College of Horticulture and Forestry, Navsari Agricultural University, Navsari, Organized by Hort. Soc. of Guj., NAU, GAAS, ACHF, Confederation of Hort. Assoc., of India (CHAI), Sponsored by NHM. : 155-163
 13. Shrivastava,P.K. (2014) Smart Horticulture through Watershed Management, Lecture deliver in Global Conference on “Technological Challenges and Human Resources for Climate Smart Horticulture Issues and Strategies” from May 28 to 31, 2014, at ASPEE College of Horticulture and Forestry, Navsari Agricultural University, Navsari, Organized by ASM Foundation and NAU :
 14. K. S. Rathva, K. G. Patel, L. K. Arvadiya, A. R. Kaswala, S. Y. Patel and B. N. Kolambe (2013) Influence of different planting geometries and organic sources on pigeonpea cv. Vaishali, National Seminar on Role of Organic Farming in Climate Resilient and Sustainable Agriculture organised by ACHF & HSG, Navsari at Navsari

15. S.Y. Patel, N.L. Patel, L.K. Arvadia, V.P. Usadadia and K.G. Patel (2013) Impact of Land configuration and organic conditioner on yield and quality of greater yam (*Dioscorea alata* L.) and soil sustainability under south Gujarat condition., National Seminar on Role of Organic Farming in Climate Resilient and Sustainable Agriculture organised by ACHF & HSG, Navsari at Navsari

Popular articles

1. P. Warpa, I K Thakur and D. Nayak. 2010. Biotechnology in wood supply and forest conservation. *Agrobios Newsletter*. Vol VIII (12): 9-11.
2. S. Masaye. S. and Nayak, D. (2010). Molecular markers in vegetable improvement, *Agrobios News Letter* Vol. VIII, Issue No. 12: 6-8.
3. Dileswar Nayak and Poonam Warpa. 2011. Pesticide Quiz. *Science reporter*, Vol.48 (03): 40.
4. Poonam and Dileswar Nayak. 2011. *Mimosa pudica*: The shy herbal weed, *Agrobios Newsletter*. Vol VIII (03): 30-31.
5. B.V. Padhiar, L.K. Arvadiya, P.P. Bhalerao and R.R. Bhalerao (Jan. 2013). *Khati Amlī*, Nation seminar on Tropical and Sub tropical Fruits at Navsari during January 9-11, 2013. Phal viseshank, pp. 112-114.
6. B.V. Padhiar, S.J. Patil, L.K. Arvadiya, P.R. Patel and A.K. Sing (Jan. 2013). Billi. Nation seminar on Tropical and Sub tropical Fruits at Navsari during January 9-11, 2013. Phal viseshank, pp. 115-116. (Silver jubilee celebration of ACHF)

Extension

Various extension activities of Department

1	Technical guidance on aspects of Soil & Water Conservation as and when required by University Research Stations
2	Advisories to several farmers on rain water harvesting
3	Laboratory analysis of Soil & Water samples with necessary guidance to farmers
4	Lectures on related topics at Krishi Vigyan Kendra's / Agricultural Technology Information Center
5	Wild life Rescue / Natures Club
6	Participation of faculties in annual Krishi Mahotsava programmes
7	Guidance on teak plantation provided to farmers
8	Participation in plantation activities at different places during Van Mahotsav
9	Technical guidance on aspects of Soil & Water Conservation as and when required by University Research Stations
10	Advisories to several farmers on rain water harvesting
11	Laboratory analysis of Soil & Water samples with necessary guidance to farmers
12	Lectures on related topics at Krishi Vigyan Kendra's / Agricultural Technology Information Center