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Theme 4: Innovative Approaches in Applied Sciences and Socio-economic Development

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# Theme 4: Innovative Approaches in Applied Sciences and Socio-economic Development

## CONTENT

<table>
<thead>
<tr>
<th>S.N.</th>
<th>TITLE AND AUTHOR</th>
<th>Pg.N.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>LEAD PAPERS</strong></td>
<td></td>
</tr>
<tr>
<td>1.</td>
<td>PACKAGING ADDS VALUE TO AGRI PRODUCE: A SUSTAINABLE APPROACH</td>
<td>1</td>
</tr>
<tr>
<td>2.</td>
<td>CARBON NANOTUBES: SYNTHESIS, CHARACTERIZATIONS AND ITS POTENTIAL APPLICATIONS</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td><strong>ABSTRACTS</strong></td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>AGRICULTURE WASTEWATER: POTENTIAL SUSTAINABLE SOLUTIONS</td>
<td>4</td>
</tr>
<tr>
<td>4.</td>
<td>PAINTOSORB™ AS AN ADSORBENT AND ITS REGENERATION</td>
<td>4</td>
</tr>
<tr>
<td>5.</td>
<td>IMPACT ASSESSMENT OF FARMERS FAIR AT UNIVERSITY LEVEL</td>
<td>4</td>
</tr>
<tr>
<td>6.</td>
<td>REMOVAL OF METAL IONS AND DETOXIFICATION OF RECALCITRANT ORGANIC DYES BY HYDROGELS</td>
<td>5</td>
</tr>
<tr>
<td>7.</td>
<td>CHEMICAL MODELS OF CYTOCHROME P450 IN DRUG METABOLISM</td>
<td>5</td>
</tr>
<tr>
<td>8.</td>
<td>INTRODUCTION OF BROCCOLI CROP IN RAINFED CONDITION UNDER NICRA VILLAGES OF BUNDLKHAND REGION</td>
<td>5</td>
</tr>
<tr>
<td>9.</td>
<td>FLORISTIC COMPOSITION CHANGE REPORTED AS A RESULT OF GRAZING AT SELECTED SITE (GRAZED SITE-YOUSMARAG) IN KASHMIR VALLEY, INDIA</td>
<td>6</td>
</tr>
<tr>
<td>10.</td>
<td>WHEAT YIELD FORECASTING IN HARYANA: A TIME SERIES APPROACH</td>
<td>6</td>
</tr>
<tr>
<td>11.</td>
<td>RESOURCE USE EFFICIENCY OF CHICKPEA PRODUCTION IN HAMIRPUR DISTRICT OF UTTAR PRADHESH</td>
<td>6</td>
</tr>
<tr>
<td>12.</td>
<td>AN INNOVATIVE APPROACH FOR ECO-FRIENDLY BEEKEEPING IN UTTARAKHAND, INDIA</td>
<td>7</td>
</tr>
<tr>
<td>13.</td>
<td>INNOVATIVE APPROACHES IN APPLIED SCIENCES AND SOCIO-ECONOMIC DEVELOPMENT GOVT. POLICIES AND PLANNING FOR SUSTAINABLE AGRICULTURE AND ALLIED SECTORS</td>
<td>7</td>
</tr>
<tr>
<td>14.</td>
<td>DEVELOPMENT OF VERSATILE SOLAR POWERED PNEUMATIC SEED CLEANING MACHINE</td>
<td>7</td>
</tr>
<tr>
<td>15.</td>
<td>IMPACT OF GOVERNMENT POLICIES OF SUSTAINABLE AGRICULTURE AND ALLIED SECTORS ON FARMING PRACTICES OF FARMERS</td>
<td>8</td>
</tr>
<tr>
<td>16.</td>
<td>USE OF ICTS ACTS AS A BOON FOR RURAL WOMEN IN SMALL SCALE FISH FARMING PRACTICE</td>
<td>8</td>
</tr>
<tr>
<td>17.</td>
<td>STUDY OF THERMAL PROPERTIES OF WOOD POLYMER COMPOSITE</td>
<td>9</td>
</tr>
<tr>
<td>18.</td>
<td>ASSESSMENT OF THE PROBLEMS FACED BY THE BENEFICIARIES OF MHWDP AND THEIR PERCEPTIONS TOWARDS DEGRADATION OF NATURAL RESOURCES</td>
<td>9</td>
</tr>
<tr>
<td>19.</td>
<td>ECONOMIC ANALYSIS OF CAULIFLOWER CULTIVATION IN INDIA</td>
<td>9</td>
</tr>
<tr>
<td>20.</td>
<td>PLANT DEFENCE MECHANISM</td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td></td>
</tr>
<tr>
<td>21.</td>
<td>EMPOWERING FARMERS' COMMUNITY THROUGH DIGITAL MEDIA IN INDIA</td>
<td></td>
</tr>
<tr>
<td>22.</td>
<td>TRANSFORMATION OF PEA WASTE (BY PRODUCTS) INTO VALUE ADDED PRODUCTS</td>
<td></td>
</tr>
<tr>
<td>23.</td>
<td>SYNTHESIS OF NEWER QUINAZOLINONE DERIVATIVES AS POTENTIAL ANTICONVULSANT AGENTS</td>
<td></td>
</tr>
<tr>
<td>24.</td>
<td>GREEN SYNTHESIS OF ZINC OXIDE NANOPIRATE AND THEIR ANTIBACTERIAL PROPERTIES</td>
<td></td>
</tr>
<tr>
<td>25.</td>
<td>COST AND RETURN ANALYSIS OF MENTHA OIL PRODUCTION IN SITAPUR DISTRICT OF UTTAR PRADESH</td>
<td></td>
</tr>
<tr>
<td>26.</td>
<td>EFFECTIVENESS AND OPINION OF AGRI-EXTENSION PERSONNEL ABOUT IT AS AN EXTENSION ADVISORY TOOL: A CASE STUDY</td>
<td></td>
</tr>
<tr>
<td>27.</td>
<td>ROLE OF MEDIA IN INDIAN EDUCATION SYSTEM</td>
<td></td>
</tr>
<tr>
<td>28.</td>
<td>STUDY OF THE EFFECT OF DIFFERENT WEATHER VARIABLES ON DIFFERENT STAGES AND FINAL SEED YIELD OF SOYBEAN CROP IN THE AKOLA REGION OF VIDARBHA, INDIA</td>
<td></td>
</tr>
<tr>
<td>29.</td>
<td>NUTRITIONAL VALUES OF MUSHROOMS</td>
<td></td>
</tr>
<tr>
<td>30.</td>
<td>DIELECTRIC SPECTROSCOPIC METHOD FOR FOOD QUALITY DETERMINATION</td>
<td></td>
</tr>
<tr>
<td>31.</td>
<td>GOVERNMENT POLICIES AND PLANNING FOR SUSTAINABLE AGRICULTURE AND ALLIED SECTOR</td>
<td></td>
</tr>
<tr>
<td>32.</td>
<td>EXTENSION AND ADVISORY SERVICES IN INDIA: CURRENT STATUS</td>
<td></td>
</tr>
<tr>
<td>33.</td>
<td>E- NAM: MARKETING INITIATIVE TOWARDS FARMER'S PROSPERITY</td>
<td></td>
</tr>
<tr>
<td>34.</td>
<td>EMERGING POTENTIAL OF FOOD PROCESSING AND ITS PARADIGM SHIFT IN ITS CONTRIBUTION TOWARDS NATIONAL INCOME.</td>
<td></td>
</tr>
<tr>
<td>35.</td>
<td>ROLE OF COOPERATIVE SOCIETIES IN AGRICULTURAL AND RURAL DEVELOPMENT</td>
<td></td>
</tr>
<tr>
<td>36.</td>
<td>IDENTIFYING THE NOVEL ANTI-MALARIAL COMPOUNDS</td>
<td></td>
</tr>
<tr>
<td>37.</td>
<td>ECONOMIC STUDY ON CREDIT UTILIZATION PATTERNS OF MARGINAL FARMS IN JAUNPUR DISTRICT OF UTTAR PRADESH</td>
<td></td>
</tr>
<tr>
<td>38.</td>
<td>TO ASCERTAIN FACTORS CONTRIBUTING TO THE GRAIN LOSS DURING STORAGE IN DIFFERENT METHODS IN TIKAMGARH BLOCK OF TIKAMGARH DISTRICT</td>
<td></td>
</tr>
<tr>
<td>39.</td>
<td>ERGONOMIC EVALUATION OF MAIZE AND PIGEON PEA PLANTERS</td>
<td></td>
</tr>
<tr>
<td>40.</td>
<td>IMPORTANCE OF UNDERUTILIZED FRUITS FOR HUMAN HEALTH BENEFITS</td>
<td></td>
</tr>
<tr>
<td>41.</td>
<td>ROLE PERFORMANCE OF RURAL WOMEN IN ANIMAL HUSBANDRY PRACTICES</td>
<td></td>
</tr>
<tr>
<td>42.</td>
<td>EXTENT OF KNOWLEDGE LEVEL OF FARMERS ABOUT PRADHAN MANTRI CROP INSURANCE SCHEME</td>
<td></td>
</tr>
<tr>
<td>No.</td>
<td>Title</td>
<td>Authors</td>
</tr>
<tr>
<td>-----</td>
<td>-----------------------------------------------------------------------</td>
<td>----------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>43.</td>
<td>SOCIO-ECONOMIC STATUS IN C.D. BLOCK KALYANPUR IN KANPUR NAGAR (U.P.)</td>
<td>Anurag Singh¹, Rajmani ², A. K. Singh³, S.R. Yadav ²</td>
</tr>
<tr>
<td>44.</td>
<td>OPPORTUNITIES FOR SOYFOODS IN INDIA</td>
<td>Anurag Nema and Harsh P. Sharma</td>
</tr>
<tr>
<td>45.</td>
<td>OHMIC HEATING: AN ALTERNATIVE FOOD PROCESSING TECHNOLOGY</td>
<td>Anurag Nema and Harsh P. Sharma</td>
</tr>
<tr>
<td>46.</td>
<td>THE ECONOMIC ANALYSIS OF AGRICULTURAL ENTERPRISES IN SUSTAINABLE DEVELOPMENT ASPECT</td>
<td>Anwesha Dey ³, Devendra Chandel ², Dinesh Kumar ³</td>
</tr>
<tr>
<td>47.</td>
<td>ANIMAL FEEDING PRACTICES AND THEIR COGNITION AMONG LIVESTOCK PRODUCERS UNDER TUTELAGE AT VETERINARY VARSITY IN PUNJAB</td>
<td>Anupama, Suresh Kumar Kansal, Jaspal Singh Hundal</td>
</tr>
<tr>
<td>48.</td>
<td>PLASMA TREATMENT: A SUSTAINABLE APPROACH TO INDUCE FUNCTIONALITY IN COTTON FABRIC</td>
<td>Archana Bahuguna ² and Shailaja D. Naik ²</td>
</tr>
<tr>
<td>49.</td>
<td>SYNTHESIS OF NOVEL QUINAZOLIN-(4(3H)-ONYL AZETIDINONES AS POTENTIAL ANTI-CONVULSANT AGENTS</td>
<td>Archana ²</td>
</tr>
<tr>
<td>50.</td>
<td>NANOTECHNOLOGY: REVOLUTIONIZING PEST MANAGEMENT IN FUTURE</td>
<td>Archi Roy ³, Dipanjali Bag ², Sadia Perween ³</td>
</tr>
<tr>
<td>51.</td>
<td>COST &amp; RETURNS OF POTATO CULTIVATION IN AGRA DISTRICT</td>
<td>Arjun Singh ³, Ranjana ³, Shravan P. and Rimjhim ³</td>
</tr>
<tr>
<td>52.</td>
<td>SOCIAL MARKETING: IMPLICATIONS IN EXTENSION</td>
<td>Arpit Huria ³ and Neelam Bhardwaj ³</td>
</tr>
<tr>
<td>53.</td>
<td>ECOTOURISM AND ITS ROLE IN SUSTAINABLE DEVELOPMENT</td>
<td>Arshid Ahmad, Mohit Husain and Nawaz Ahmad Teli</td>
</tr>
<tr>
<td>54.</td>
<td>NANOTECHNOLOGY: A BOON FOR REVOLUTIONIZED AGRICULTURE</td>
<td>Arti Goel</td>
</tr>
<tr>
<td>55.</td>
<td>FARMER’S KNOWLEDGE LEVEL ABOUT RECOMMENDED BRINJAL PRODUCTION TECHNOLOGY</td>
<td>Arvind Kumar Singh ³, Amit Chatterjee ³, Y. D. Mishra ³, Priyanka Jadon ³, Mahesh Patidar ³, Bharti Parmar ³</td>
</tr>
<tr>
<td>56.</td>
<td>WOMEN ENTREPRENEURSHIP IN INDIA; PRESENT STATUS, DIRECTIONS AND ACHIEVEMENTS</td>
<td>Arvind Pratap Singh ³, Prakash Singh ³, R.K. Doharey ³, Kaushik Prasad ³, Manoj Kumar ³, Addharmendra Singh ³</td>
</tr>
<tr>
<td>57.</td>
<td>IMPACT OF INTEGRATED NUTRIENT MANAGEMENT ON SOIL HEALTH AND CROP IMPROVEMENT</td>
<td>Asha Serawat ² and Minakshi Serawat ²</td>
</tr>
<tr>
<td>58.</td>
<td>FOOD SECURITY IN INDIA: PROBLEMS AND PROSPECTS</td>
<td>Ashok Kumar Kushwaha and Anuj Pratap Singh</td>
</tr>
<tr>
<td>59.</td>
<td>ECONOMICS OF SUGARCANE CULTIVATION IN GHAZIPUR DISTRICT OF UTTAR PRADESH</td>
<td>Ashutosh Kumar Ranjan, Dr. R.R. Kushwaha, Bhartendu Yadav</td>
</tr>
<tr>
<td>60.</td>
<td>COMPARISON OF SOIL DATA OF AMANIGANJ BLOCK, FAIZABAD WITH SATELLITE IMAGERY USING GIS</td>
<td>Asritha, V.P. and Yadav, N.K</td>
</tr>
<tr>
<td>61.</td>
<td>AGRICULTURAL POLICY IN INDIA</td>
<td>Ayaz Ahmad ³ and S.P. Singh</td>
</tr>
<tr>
<td>62.</td>
<td>IMPACT OF INTEGRATED NUTRIENT MANAGEMENT ON SOIL HEALTH AND CROP IMPROVEMENT</td>
<td>Babulal Dhayal ³, Rajeev Bairathi ², and Anil Kumar Malik</td>
</tr>
<tr>
<td>63.</td>
<td>USE OF BIOFORTIFIED FOOD IN HUMAN WELFARE</td>
<td>Ayaz Ahmad ³ and S.P. Singh</td>
</tr>
<tr>
<td>64.</td>
<td>FOOD SECURITY IN INDIA: PROBLEMS AND PROSPECTS</td>
<td>Asritha, V.P. and Yadav, N.K</td>
</tr>
<tr>
<td>65.</td>
<td>FORESTS AND SUSTAINABLE LIVELIHOOD DEVELOPMENT</td>
<td>Azeez Raja, Shiba Zahoore and Mohit Husain</td>
</tr>
<tr>
<td>66.</td>
<td>OPINION OF FARMERS TOWARDS PRADHAN MANTRI CROP INSURANCE SCHEME IN UDAIPUR DISTRICT OF RAJASTHAN</td>
<td>Babulal Dhayal ³, Rajeev Bairathi ², and Anil Kumar Malik</td>
</tr>
<tr>
<td>No.</td>
<td>Title</td>
<td>Authors</td>
</tr>
<tr>
<td>-----</td>
<td>-----------------------------------------------------------------------</td>
<td>------------------------------------------------------------------------</td>
</tr>
<tr>
<td>66.</td>
<td>THE EFFECT OF INCOME AND EMPLOYMENT ON DIVERSIFIED FARMS OF KANPUR DEHAT (U.P.)</td>
<td>Balwan Singh*, Nirmal Kumar and Birendra Kumar</td>
</tr>
<tr>
<td>67.</td>
<td>ZERO BUDGET NATURAL FARMING IN INDIA</td>
<td>Bankerlang Khongwir*, Vikas**</td>
</tr>
<tr>
<td>68.</td>
<td>GEOGRAPHIC INFORMATION SYSTEMS AS AN INSTRUMENT OF RESOURCE MANAGEMENT FOR THE INTERESTS OF SOIL AND WATER CONSERVATION</td>
<td>Basudevi Yadav*, Jayshree Jhala**, Omparakash***</td>
</tr>
<tr>
<td>69.</td>
<td>DECISION MAKING PATTERN OF RURAL WOMEN IN FARMING AND ALLIED ENTERPRISES IN REWA BLOCK OF DISTRICT REWA (M.P.)</td>
<td>Beena Singh¹, Nipun Kumar Pandey², Radha Morya³</td>
</tr>
<tr>
<td>70.</td>
<td>AWARENESS REGARDING ASPECTS OF SUN PROTECTION AND DEVELOPED SUSTAINABLE UV PROTECTIVE CLOTHING FOR COLLEGE GOING GIRLS</td>
<td>Beenu Singh¹ and Manisha Gahlot²</td>
</tr>
<tr>
<td>71.</td>
<td>INTELLECTUAL PROPERTY RIGHTS (IPRS): IT’S ROLE IN PROTECTION OF AGRICULTURE TECHNOLOGY AND INNOVATION</td>
<td>Bharat Lal Meena, Vivek Srivastava</td>
</tr>
<tr>
<td>72.</td>
<td>IMPACT OF NEW TECHNOLOGY ON AGRICULTURE IN INDIA</td>
<td>Bhartendu Yadav, Brijesh Kumar Patel, Pavan Kumar Singh, and Ajeet Kumar</td>
</tr>
<tr>
<td>73.</td>
<td>PHYSIOCHEMICAL CHARACTERISTICS OF RIVER KRISHNI WATER IN PRE-MONSOON SEASON</td>
<td>Bharti¹, Amrish Kumar⁸, J.S. Jangwan⁴, Vivek Kumar⁸</td>
</tr>
<tr>
<td>74.</td>
<td>NANOTECHNOLOGY: AN ADVANCED APPROACH IN IMPROVING THE IRON CONTENT OF POTATOES</td>
<td>Bichhina Maitri Rout</td>
</tr>
<tr>
<td>75.</td>
<td>ROLE OF AGRICULTURAL CREDIT IN INDIA</td>
<td>Brijesh Kumar Patel, Pavan Kumar Singh, Pankaj Kumar Singh, Bhartendu Yadav, Vijay Kumar</td>
</tr>
<tr>
<td>76.</td>
<td>CONFRONTATIONS WITH AGROBUSINESS IN INDIA</td>
<td>C. Kishore</td>
</tr>
<tr>
<td>77.</td>
<td>TESTICULAR DEVELOPMENTAL PROGRESSION DURING ANNUAL REPRODUCTIVE CYCLE IN CHANNA PUNCTATUS</td>
<td>C.P. Singh², V.K. Misra² and Anup Kumar³</td>
</tr>
<tr>
<td>78.</td>
<td>MELIA DUBIA: UTILITY FOR PULP INDUSTRY IN INDIA</td>
<td>D. R. Prajapati*, N. S. Thakur and Ravindra Kumar Dhaka</td>
</tr>
<tr>
<td>79.</td>
<td>GEOGRAPHIC INFORMATION SYSTEM FOR GENERATING NATURAL STREAMS AND SPATIAL PATTERN OF SOIL EROSION: A CASE STUDY IN NAINITAL, INDIA</td>
<td>Daniel Prakash Kushwaha⁴, Sachin Kumar Singh⁴, Anurag Malik⁴</td>
</tr>
<tr>
<td>80.</td>
<td>PROBLEMS AND PROSPECTS OF TRIBAL YOUTH WITH SPECIAL REFERENCE TO AGRICULTURE AS LIVELIHOOD</td>
<td>Debashis Dash¹, Amardeep²</td>
</tr>
<tr>
<td>81.</td>
<td>A REVIEW ON BIODEGRADATION OF MELANOIDINS FROM SUGARCANE MOLASSES BASED DISTILLERY EFFLUENT</td>
<td>Deeksha Yajurvedi</td>
</tr>
<tr>
<td>82.</td>
<td>THE ROLE OF ICT ON EMPOWERING WOMEN</td>
<td>Dheerendra Kumar¹, Jagatpal², Ankit Singh Yadav¹ and Shankar Dayal Bharti⁴</td>
</tr>
<tr>
<td>83.</td>
<td>EXTENT OF ADOPTION AND ATTITUDE OF THE FARM WOMEN TOWARDS IMPROVED ANIMAL HUSBANDRY PRACTICES</td>
<td>Diksha Sharma¹, Sonika Sharma², Suman Sharma³, Nakum Pooja⁴</td>
</tr>
<tr>
<td>84.</td>
<td>EXTENSION STRATEGIES INCLUDING E-INITIATIVES TOWARD FARMER PROSPERITY</td>
<td>Dinesh Kumar*, Devendra Chandel <strong>, Anwesha Dey</strong>*</td>
</tr>
<tr>
<td>85.</td>
<td>NANOTECHNOLOGY: AN EMERGING TECHNOLOGY FOR PLANT DISEASE MANAGEMENT.</td>
<td>Dipanjali Bag¹, Kamal Khilar², Sadia Perween², Archi Roy²</td>
</tr>
<tr>
<td>86.</td>
<td>A STUDY OF SOCIO PSYCHOLOGICAL FACTORS ASSOCIATED WITH THE CREDIT BEHAVIOUR OF FARMER IN ETAH DISTRICT OF U.P.</td>
<td>Ausan Singh</td>
</tr>
<tr>
<td>No.</td>
<td>Title</td>
<td>Authors</td>
</tr>
<tr>
<td>-----</td>
<td>----------------------------------------------------------------------</td>
<td>------------------------------------------------------------------------</td>
</tr>
<tr>
<td>88</td>
<td>IDENTIFICATION OF INDUSTRIAL HAZARDS USING ALOHA</td>
<td>MD. AMINUZZAMAN</td>
</tr>
<tr>
<td>89</td>
<td>INNOVATIVE STRATEGIES FOR DOUBLING FARMER’S INCOME</td>
<td>PARVEEN KUMAR, R. K. ARORA, PAWAN KUMAR, VIJAY KUMAR, KUNAL JAMWAL</td>
</tr>
<tr>
<td>90</td>
<td>STRATEGIES FOR REDUCING EMPLOYMENT VULNERABILITY OF RURAL YOUTH IN THE HILLS OF UTTARAKHAND</td>
<td>RENU GANGWAR AND S K KASHYAP</td>
</tr>
<tr>
<td>91</td>
<td>ROLE OF PARAMPARAGAT KRISHI VIKAS YOJANA IN AGRICULTURAL DEVELOPMENT</td>
<td>ROOP KUMAR, AMIT KUMAR MISHRA AND BINDHYA PRASAD</td>
</tr>
<tr>
<td>92</td>
<td>ORGANIC ELECTRONICS: IMPORTANCE TO SUSTAINABLE DEVELOPMENT</td>
<td>SHIKHA JAIWAL</td>
</tr>
<tr>
<td>93</td>
<td>SUBJECT MATTER KNOWLEDGE OF ANGANWADI WORKERS (ICDS) IN DIFFERENT AREAS OF COMPETENCIES</td>
<td>SHOBHA RANI* &amp; DEVENDRA KUMAR**</td>
</tr>
<tr>
<td>94</td>
<td>IMPACT OF NUTRITION TRAINING ON KNOWLEDGE OF RURAL WOMEN</td>
<td>Shobha Rani1, Devendra Kumar2 &amp; Maya Kumari3</td>
</tr>
<tr>
<td>95</td>
<td>A COMPREHENSIVE STUDY ON IMPACT OF FACILITY BASED NUTRITIONAL CARE ON MALNOURISHED FEMALE CHILDREN</td>
<td>SWETA RATHI AND NEHA VASHISTHA</td>
</tr>
<tr>
<td>96</td>
<td>KUPOSHAN BHARAT CHHORO: A STUDY ON THE PREGNANT WOMEN AND IMPACT OF ANEMIA ON THEIR HEALTH</td>
<td>DROPATI SARAN, SHREE RAKESH AND BHARAT LAL</td>
</tr>
<tr>
<td>97</td>
<td>INFORMATION AND COMMUNICATION TECHNOLOGY (ICT) USE IN AGRICULTURE</td>
<td>EKTA HOODA</td>
</tr>
<tr>
<td>98</td>
<td>PROBLEMS ENCOUNTERED BY THE RESPONDENTS IN ADOPTION OF AGRO-FORESTRY</td>
<td>EKTA* AND SURAJ VARMA</td>
</tr>
<tr>
<td>99</td>
<td>NUTRACEUTICAL AND THERAPEUTIC PROPERTIES OF AEGLE MARMELOS (L.): AN OVERVIEW</td>
<td>ENA GUPTA1, NEELESH KUMAR MAURYA2, SNEHLATA SHAKYAWAR1 AND SHANTHY SUNDARAM3</td>
</tr>
<tr>
<td>100</td>
<td>ECONOMICS ANALYSIS OF GARLIC</td>
<td>FOZIA HAMEED*, NAVEED HAMID** AND ANJUM AYOUB*</td>
</tr>
<tr>
<td>101</td>
<td>VALUE ADDITION OF UNDERUTILIZED FRUITS: CASE OF INCREASING FARMER'S INCOME</td>
<td>FOZIA HAMEED*, NEERAJ GUPTA, **NAVEED HAMID AND *ANJUM AYOUB</td>
</tr>
<tr>
<td>102</td>
<td>UTILISATION OF BACKYARD FARM POND THROUGH PISCICULTURE FOR ENHANCING NUTRITIONAL FOOD SECURITY</td>
<td>GANESH KEJRIWAL AND VISWA RANJAN SAMANTRAY</td>
</tr>
<tr>
<td>103</td>
<td>RELEVANCE OF INFORMATION AND COMMUNICATION TECHNOLOGY IN EDUCATION</td>
<td>GARGI PALIWAL1; UNMESHA PRAJNASHREE2; DIPANJALI BAG3</td>
</tr>
<tr>
<td>104</td>
<td>FARMERS’ PERCEPTIONS ON PRODUCTION AND MARKETING OF MEDICINAL AND AROMATIC PLANTS IN KULLU DISTRICT OF HIMACHAL PRADESH-INDIA</td>
<td>GAURAV KUMAR AND R.N. YADAV</td>
</tr>
<tr>
<td>105</td>
<td>ECONOMIC ANALYSIS OF AGRICULTURAL PRODUCTION AND MARKETING OF MUNSYARI REGION</td>
<td>GEETA AND CHHAVI ARYA</td>
</tr>
<tr>
<td>106</td>
<td>EVALUATION OF PRODUCTION POTENTIAL OF PEARL MILLET (PENNISETUM GLAUCUM L.) ACCESSIONS AS AFFECTED BY DIFFERENT CUTTING MANAGEMENTS AND IRRIGATION WATER QUALITY</td>
<td>GOVIND MAKARANA14*, R.K. YADAV2, RAKESH KUMAR3, P. SHEORAN3 AND TARAMANI YADAV5</td>
</tr>
<tr>
<td>107</td>
<td>ROLE OF WOMEN IN SERICULTURE</td>
<td>GUBBALA VENKATASAIKIRAN</td>
</tr>
<tr>
<td>108</td>
<td>PERFORMANCE OF MAIZE SHELLER IN DIFFERENT VILLAGES OF EAST KAMENG DISTRICT, ARUNACHAL PRADESH</td>
<td>HABUNG GANGA</td>
</tr>
<tr>
<td>Title</td>
<td>Page</td>
<td></td>
</tr>
<tr>
<td>----------------------------------------------------------------------</td>
<td>------</td>
<td></td>
</tr>
<tr>
<td>STRATEGIES FOR CONSERVATION OF DOMESTIC ANIMAL DIVERSITY IN INDIA</td>
<td>44</td>
<td></td>
</tr>
<tr>
<td>HANUMAN LAL NEHRA¹, SUBHASH YADAV² AND VINOD BHATESHWAR²</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DEMONETIZATION AND ITS IMPACT ON INDIAN ECONOMY</td>
<td>44</td>
<td></td>
</tr>
<tr>
<td>HARKESH KUMAR BALAI¹ AND K.C. BAIRWA²</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NANOTECHNOLOGY AS A TOOL FOR MANAGING INSECT PEST IN AGRICULTURE</td>
<td>44</td>
<td></td>
</tr>
<tr>
<td>HASHIB ANSARI</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ECONOMIC ANALYSIS OF INPUTS USE PATTERN IN WHEAT CROP IN SEMI-IRRIGATED ZONE OF HARYANA</td>
<td>45</td>
<td></td>
</tr>
<tr>
<td>HEENA¹, LUHACH V. P.², SUNITA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NON-TRADITIONAL PRODUCTS FROM KOKUM: INLAND AND GLOBAL OPPORTUNITIES FOR DOUBLING FARMERS INCOME</td>
<td>45</td>
<td></td>
</tr>
<tr>
<td>HEMALATHA¹, G. CHANDRAMOHANA REDDY² AND SHIVAKUMAR, S.N.³</td>
<td></td>
<td></td>
</tr>
<tr>
<td>EFFECT OF SALICYLIC ACID ON PLANTS UNDER ABIOTIC STRESS</td>
<td>45</td>
<td></td>
</tr>
<tr>
<td>HEMENDER, V. S. MOR, SUSHMA SHARMA, JITENDER AND SONALI SANGWAN</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DEVELOPENT OF HANDICRAFT PRODUCTS THROUGH HAND EMBROIDERY: AN INNOVATIVE APPROACH</td>
<td>46</td>
<td></td>
</tr>
<tr>
<td>HIMANI VERMA¹ AND MANISHA GAHLOT²</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NUTRIENT EXPERT SYSTEM: PROS AND CONS</td>
<td>46</td>
<td></td>
</tr>
<tr>
<td>HIMANSU SEKHAR GOUDA¹, Y. V. SINGH², SOMANATH NAYAK³, RUXANABI NARAGUND⁴</td>
<td></td>
<td></td>
</tr>
<tr>
<td>IMPACT OF GREEN CHEMISTRY ON ENVIRONMENT</td>
<td>47</td>
<td></td>
</tr>
<tr>
<td>¹INDU SINGH AND ²MUNESH</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SUSTAINABLE LIVELIHOOD SECURITY INDEX: A TOOL FOR ESTIMATION OF SUSTAINABILITY IN AGRICULTURE</td>
<td>47</td>
<td></td>
</tr>
<tr>
<td>ISHA SHARMA*, AND NITIN SHARMA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PRADHAN MANTRI UJJWAŁA YOJANA</td>
<td>47</td>
<td></td>
</tr>
<tr>
<td>JAGATPAL</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SWACHH BHARAT ABHIYAN</td>
<td>48</td>
<td></td>
</tr>
<tr>
<td>JAGATPAL¹, ANKIT SINGH YADAV², DHEERENDRA KUMAR¹</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ANALYSIS OF PRICES AND ARRIVALS OF APPLE FRUIT IN NARWAL MARKET OF JAMMU</td>
<td>48</td>
<td></td>
</tr>
<tr>
<td>JAHANGIR ALI¹, JYOTI KACHROO¹, DEEP JIBHAT, ANIL BHAT ¹ AND NAVEED HAMID²</td>
<td></td>
<td></td>
</tr>
<tr>
<td>E-LEARNING EDUCATIONAL SYSTEM FOR DEVELOPMENT</td>
<td>49</td>
<td></td>
</tr>
<tr>
<td>JYOTI RANI AND NISHA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>AGRICULTURAL MARKETING, ENTREPRENEURSHIP DEVELOPMENT, IMPORT-EXPORT AGRI-COMMODITIES</td>
<td>49</td>
<td></td>
</tr>
<tr>
<td>KAJAL KHOSLA*, KAVITA KHOSLA, AND VASHUHNDRA KUSHWAHA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CROPPING PATTERN OF THE AWARDEE FARMERS FOR IMPROVING THE AGRICULTURE IN THE KONKAN REGION</td>
<td>49</td>
<td></td>
</tr>
<tr>
<td>KALE N. D.¹, GHOLOPE S. M.², MURALI A. M.¹ AND DESAI A. N.⁴</td>
<td></td>
<td></td>
</tr>
<tr>
<td>GOVERNMENT POLICIES AND PLANNING FOR SUSTAINABLE AGRICULTURE AND ALLIED SECTOR</td>
<td>50</td>
<td></td>
</tr>
<tr>
<td>KALPANA MANDAIYA, V. KAMALVANSHI, SARTHAK GHIMIRE, BHARAT D. V.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>IMPACT OF MID-HIMALAYAN WATERSHED DEVELOPMENT PROJECT ON EMPLOYMENT GENERATION AND PROBLEMS FACED BY BENEFICIARY FARMER’S IN HIMACHAL PRADESH</td>
<td>50</td>
<td></td>
</tr>
<tr>
<td>KAPIL DEV¹, RAVINDER SHARMA², AND AMIT GULERIA³</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ENTREPRENEUR’S QUALITIES AND ENTREPRENEURIAL SKILLS FOR AGRIPRENEURSHIP</td>
<td>50</td>
<td></td>
</tr>
<tr>
<td>KARTIKCHOUHDHARY</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ROLE OF EDUCATION IN WOMEN EMPOWERMENT</td>
<td>51</td>
<td></td>
</tr>
<tr>
<td>KAUSHIK PRASAD², PRAKASH SINGH¹, ARVIND PRATAP SINGH¹, MANOJ KUMAR¹, ATUL KUMAR¹, KAMAL KISHORE¹ AND SUBODH KUMAR²</td>
<td></td>
<td></td>
</tr>
<tr>
<td>HACCP IMPLEMENTATION ON BEER PRODUCTION FROM BARLEY</td>
<td>51</td>
<td></td>
</tr>
<tr>
<td>KAVINDRA SINGH, PRINCE, VAISHALLI TARUN KUMAR</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ROLE OF DIFFERENT SOCIO-ECONOMIC FACTORS IN FARMER SUICIDES AND ITS MITIGATION</td>
<td>52</td>
<td></td>
</tr>
<tr>
<td>¹KHYATI SINGH*, ²MUKESH KUMAR MEHLA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ROLE OF MOBILE PHONE TECHNOLOGY IN IMPROVING SMALL FARM PRODUCTIVITY</td>
<td>52</td>
<td></td>
</tr>
<tr>
<td>KIRAN BALA AND NISHA TIWARI</td>
<td></td>
<td></td>
</tr>
<tr>
<td>134.</td>
<td>IMPACT OF GST ON FARMERS</td>
<td>KIRAN*1, KIRTI1 AND BHAWANA KUMARI3</td>
</tr>
<tr>
<td>135.</td>
<td>GERIATRIC NUTRITION: IMPORTANCE</td>
<td>KIRTI M. TRIPATHI1, S. K. DUBEY2, AMIT SINGHA1 AND SATISH KUMAR4</td>
</tr>
<tr>
<td>136.</td>
<td>ROLE OF FARM WOMEN: NEED OF AWARENESS GENERATION</td>
<td>KIRTI M. TRIPATHI AND AMIT SINGHA</td>
</tr>
<tr>
<td>137.</td>
<td>HOUSEHOLD FOOD AND NUTRITIONAL SECURITY FROM LOCALLY AVAILABLE FOODS</td>
<td>KIRTI M. TRIPATHI AND AMIT SINGHA</td>
</tr>
<tr>
<td>138.</td>
<td>GENDER MAINSTREAMING IN AGRICULTURE AND ALLIED SECTORS FOR ENHANCING FOOD AND NUTRITIONAL SECURITY</td>
<td>KIRTI M. TRIPATHI AND AMIT SINGHA</td>
</tr>
<tr>
<td>139.</td>
<td>WASTE MANAGEMENT OF FRUITS</td>
<td>KOMAL*1, JOGINDER KUMAR2 AND RAKESH KUMAR3</td>
</tr>
<tr>
<td>140.</td>
<td>ASSOCIATION BETWEEN CONSTRAINTS ENCOUNTERED BY THE FARMERS IN ADOPTION OF DRIp IRRIGATION SYSTEM AND THEIR SELECTED INDEPENDENT VARIABLES</td>
<td>KRISHNA YADAV*, J.P. YADAV** AND SEEMA YADAV ***</td>
</tr>
<tr>
<td>141.</td>
<td>NANOTECHNOLOGY –A NOVEL APPROACH IN AGRICULTURE</td>
<td>KRISHNAVENI VARALA*, SWATHI REKHA NANDIGAM1, ASHOK SINGAMSETTI3</td>
</tr>
<tr>
<td>142.</td>
<td>IMPACT OF MUSHROOM CULTIVATION ON SOCIO-ECONOMIC STATUS OF RURAL WOMEN IN SAMASTIPUR DISTRICT OF BIHAR. KUMARI SHIPRA! MAYA KUMARI AND RENUKUMARI</td>
<td>55</td>
</tr>
<tr>
<td>143.</td>
<td>MANAGEMENT OF INTELLECTUAL PROPERTY RIGHTS IN INDIA</td>
<td>LAD DHAKAR*, SEEMAJAT** AND MANISHA VERMA</td>
</tr>
<tr>
<td>144.</td>
<td>MARKETING CHANNEL OF MENTHOL MINT (MENTHA) IN SITAPUR DISTRICT, UTTAR PRADESH</td>
<td>LALIT KR. VERMA*, NITIN KR. NAG 2 AND PUKHRAJ SINGH1</td>
</tr>
<tr>
<td>145.</td>
<td>FARM ENERGY BALANCE AND MANAGEMENT: THE SOCIO-ECOLOGICAL, ECONOMIC AND ENVIRONMENTAL ANALYSIS</td>
<td>LOKESH KUMAR TINDE*1 AND S. K. ACHARYA</td>
</tr>
<tr>
<td>146.</td>
<td>DOUBLING THE FARMERS INCOME THROUGH INNOVATIVE APPROACH</td>
<td>LOKESH KUMAR*, ANITA* OMPRAKASH*, NANDRA KUMAR VERMA**</td>
</tr>
<tr>
<td>147.</td>
<td>HALOXYLON SALICORNICUM - A SOURCE OF NUTRITION IN ARID RAJASTHAN</td>
<td>MALA RATHORE AND HEMANT KUMAR</td>
</tr>
<tr>
<td>148.</td>
<td>ROLE OF SOIL PHYSICS FOR ENHANCING SOIL PRODUCTIVITY</td>
<td>MALLO DEVI</td>
</tr>
<tr>
<td>149.</td>
<td>BETALAINS – ROLE IN CARDIOVASCULAR DISEASES AND THALASSEMIA</td>
<td>MAMTA RANI*1 AND PINKY BOORA2</td>
</tr>
<tr>
<td>150.</td>
<td>STUDY ON PHYTOCHEMICAL CHARACTERIZATION AND ANTIBACTERIAL ACTIVITY OF FRUIT TREES OF CHAMOLI DISTRICT, UTTARAKHAND</td>
<td>MANEESHA SINGH*, RAKHI1, MANISH DEV SHARMA2 AND ANJU RANI3</td>
</tr>
<tr>
<td>151.</td>
<td>REASONS AND SATISFACTION LEVEL OF USING CASHLESS PAYMENT METHODS BY RESPONDENTS</td>
<td>MANISHA OHLAN AND ELA RANI*</td>
</tr>
<tr>
<td>152.</td>
<td>APICULTURE: A GROWING TREND IN INDIA</td>
<td>MANISHA*, VIJAYA, SANGEETA TIWARI AND GULSHAN KUMAR</td>
</tr>
<tr>
<td>153.</td>
<td>ROLE OF POLICIES TO PRODUCE QUALITY SEED OF VEGETABLE CROPS</td>
<td>MANJU VERMA*1, SEEMA KASOTIYA2, KUMARI LATA1, LALI JAT4</td>
</tr>
<tr>
<td>154.</td>
<td>SCOPE AND IMPORTANCE OF HONEYBEE FARMING IN INDIA</td>
<td>MANMOHAN SINGH BISEN*, YOGESH KUMAR SIDAR, JAI KISHAN BHAGAT AND AKHILESH KUMAR</td>
</tr>
<tr>
<td>155.</td>
<td>ROLE OF WOMEN IN SERICULTURE AND COMMUNITY DEVELOPMENT</td>
<td>MANMOHAN SINGH BISEN*, YOGESH KUMAR SIDAR, JAI KISHAN BHAGAT AND AKHILESH KUMAR.</td>
</tr>
<tr>
<td>Page</td>
<td>Title</td>
<td>Authors</td>
</tr>
<tr>
<td>------</td>
<td>----------------------------------------------------------------------------------------------------------------------------------------</td>
<td>---------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>156.</td>
<td>ROLE OF KVKS IN AGRICULTURAL EXTENSION</td>
<td>MANOJ KUMAR MAHANTA¹, JEEBAN KUMAR BISWAL² AND DEBASIS JAYAPURIA³</td>
</tr>
<tr>
<td>157.</td>
<td>DYE SENSITIZED SOLAR CELLS BASED ON NATURAL DYES AS SENSITIZERS: A REVIEW</td>
<td>MINAKSHI¹, BULKESHWAR² AND DEVENDRA MOHAN²</td>
</tr>
<tr>
<td>158.</td>
<td>ESTIMATION OF POPULATION VARIANCE USING NON-CONVENTIONAL LOCATION PARAMETERS IN ABSENCE AND PRESENCE OF NON-RESPONSE</td>
<td>'MIR SUBZAR*, S. MAQBOOL, 'T A RAJA AND 'M A BHAT</td>
</tr>
<tr>
<td>159.</td>
<td>SIZING OF OFR UNDER DIFFERENT CROPPING SITUATIONS USING THE WATER BALANCE MODEL</td>
<td>MITTHILESH KUMAR¹, SUDHINDRA N. PANDA², BHARAT C. SAHOO³</td>
</tr>
<tr>
<td>160.</td>
<td>INCREASING ECONOMY AND FARMER’S INCOME BY CONTROLLING THE EFFECT OF BIOTIC AND ABIOTIC FACTORS ON SHELF LIFE OF KANGRA TEA</td>
<td>MITTU KATOCH¹️, PARMOD VERMA, SATYANARAYAN MALLADI MURTHY AND RAJJU PRIYA SONI</td>
</tr>
<tr>
<td>161.</td>
<td>SOIL HEALTH CARD SCHEME</td>
<td>MOHAMMAD IMRAN, S.A. KERKHI, L.K. GANGWAR AND MOHAMMAD RIZWAN</td>
</tr>
<tr>
<td>162.</td>
<td>APPLICATIONS OF INFRARED RADIATION IN FOOD PROCESSING: A REVIEW</td>
<td>MOHD ISHFAQ BHAT¹, NAVIN CHANDRA SHAHIT²</td>
</tr>
<tr>
<td>163.</td>
<td>EXPLOITATION OF UNDER-UTILIZED FIBRES FOR EARTH'S RESTORATION AND INCOME GENERATION</td>
<td>MONIKA NEGI¹, ANITA RANI¹ AND ANUPRIYA SINGH³</td>
</tr>
<tr>
<td>164.</td>
<td>ROLE OF HOME SCIENCE IN INCREASING LIVELIHOOD AND ACCELERATING DEVELOPMENT IN RURAL AREAS</td>
<td>MS TANUJA JUKARIYA¹ AND PREMLATA²</td>
</tr>
<tr>
<td>165.</td>
<td>IMPACT AND CONSTRAINTS OF TOILET SCHEME FOR RURAL WOMEN’S SECURITY IN INDIA</td>
<td>DIPIKA SACHAN</td>
</tr>
<tr>
<td>166.</td>
<td>ROLE OF WOMEN IN ENVIRONMENTAL SECURITY IN INDIA</td>
<td>JYOTI GUPTA</td>
</tr>
<tr>
<td>167.</td>
<td>SUSTAINABLE IMPACT OF SWACHHI BHARAT ABHIYAN IN INDIAN SOCIETY</td>
<td>SNEH LATA SINGH</td>
</tr>
<tr>
<td>168.</td>
<td>MEDICINAL AND AROMATIC CROPS: POTENTIAL SOURCE FOR ENHANCING FARMER'S INCOME IN INDIA VANDNA</td>
<td></td>
</tr>
<tr>
<td>169.</td>
<td>ACCEPTABILITY OF FIBRE RICH COOKIES DEVELOPED FROM POMEGRANATE PEEL FLOUR</td>
<td>MUMTAZ BEGUM, ZEBISH ALI AND RITU TOIJAM</td>
</tr>
<tr>
<td>170.</td>
<td>PERFORMANCE OF FARMER PRODUCER ORGANATIONS (FPOS) IN ANDHRA PRADESH</td>
<td>'NAGESH HH, 'HARISHA, N AND 'MUKUNDA RAO. B</td>
</tr>
<tr>
<td>171.</td>
<td>ECONOMIC ANALYSIS OF PRODUCTION AND MARKETING OF AGRI-ENTERPRISES</td>
<td>NARESH KUMAR¹, BHAG CHANDRA JAIN²</td>
</tr>
<tr>
<td>172.</td>
<td>NATURAL RESOURCES AND EDUCATION FOR SUSTAINABLE DEVELOPMENT</td>
<td>NARESH KUMAR¹, RAJA RAM BUNKER ** DEVENDRA CHANDEL.***</td>
</tr>
<tr>
<td>173.</td>
<td>AGRICULTURAL MARKETING, ENTERPRENEURSHIPS DEVELOPMENT AND IMPORT-EXPORT OF AGRICULTURAL COMMODITIES</td>
<td>NARESH KUMAR¹, BHUPENDRA²</td>
</tr>
<tr>
<td>174.</td>
<td>IMPACT OF WOMEN'S EDUCATION ON THE GROWTH OF AGRICULTURAL BASED SMALL SCALE INDUSTRIES</td>
<td>NAVNEET KUMAR SINGH*, SAKET KUSHWAHA, RAVI SHANKAR GIRI, MONU KUMAR JHA, AND YOGESH KUMAR</td>
</tr>
<tr>
<td>175.</td>
<td>STUDY ON ENVIRONMENTAL ETHICS AMONG THE HIGHER SECONDARY STUDENTS</td>
<td>NAZMEEN BANO¹, R. K. VERMA¹ AND ROHIT MAURY</td>
</tr>
<tr>
<td>176.</td>
<td>OPINION LEADERSHIP AMONG FARM WOMEN: A STRATEGY FOR WOMEN INCLUSION IN DEVELOPMENT</td>
<td>NEELAM BASERA¹, NEELAM BHARDWAJ¹ AND BIRENDRA KUMAR</td>
</tr>
<tr>
<td>177.</td>
<td>DAIRY SECTOR GROWTH IN INDIA VIS-À-VIS HARYANA</td>
<td>NEELAM KUMARI</td>
</tr>
<tr>
<td>178.</td>
<td>ECO-WASTE MANAGEMENT</td>
<td>NEENU POONIA, VIVEK SINGH, NISHA ARYA AND SUSHILA</td>
</tr>
<tr>
<td>179.</td>
<td>KRISHI VIGYAN KENDRA: A POWERFUL TOOL TO TRANSFORM AGRICULTURE</td>
<td>NEERJA SHARMA¹, DEEPSHIKHA², VIRENDER GANGWAR, SHEETAL BADYAL</td>
</tr>
<tr>
<td>180.</td>
<td>NUTRITION GARDEN AN INTERVENTION AGAINST MALNUTRITION: A CASE STUDY ON NICRA VILLAGE.</td>
<td>NEERJA SHARMA¹, DEEPSHIKHA²</td>
</tr>
<tr>
<td>181.</td>
<td>AN ECONOMIC ANALYSIS OF PRODUCTION &amp; MARKETING OF MUSTARD IN MORENA DISTRICT OF MADHYA PRADESH</td>
<td>NEETU SINGH*, RAHUL KUMAR², J. K. GUPTA³, R. K. GUPTA４, J. S. GURJAR⁵</td>
</tr>
<tr>
<td>182.</td>
<td>SYNTHETIC STUDY OF GALACTOPYRANOSYL AMINO ALCOHOLS AND THEIR BIOEVALUATION</td>
<td>NEETU TRIPATHI</td>
</tr>
<tr>
<td>183.</td>
<td>ANTIMICROBIAL EFFICACY OF THELYPTERIS DENTATA AND POLYSTICHUM DISCRETUM AGAINST GRAM POSITIVE AND GRAM NEGATIVE BACTERIA CAUSING INFECTIONS IN HUMANS.</td>
<td>NEHA CHAUHAN, CHHAYA SINGH, SHAGUN GUPTA</td>
</tr>
<tr>
<td>184.</td>
<td>EXTENSION STRATEGIES INCLUDING E-INITIATIVES TOWARDS FARMERS PROSPERITY</td>
<td>NEMI CHAND MEENA</td>
</tr>
<tr>
<td>185.</td>
<td>DIETARY PATTERN OF ADOLESCENCE GIRLS OF URBAN, RURAL AND SLUM AREAS</td>
<td>NIDHEE SACHAN* AND GIRISH GOYAL**</td>
</tr>
<tr>
<td>186.</td>
<td>ICT AS EFFECTIVE TOOL FOR DEVELOPMENT OF RURAL INDIA</td>
<td>NIDHI SHARMA AND AMIT KUMAR</td>
</tr>
<tr>
<td>187.</td>
<td>STUDIES ON LIQUID MANURE BASED DRIP FERTIGATION ON WATER USE, QUALITY AND PRODUCTIVITY OF ONION</td>
<td>NIHAR GUPTA¹*, NAVEEN DATT², SANJAY K SHARMA³, RAJ PAUL SHARMA⁴ AND S.S. RANA⁵</td>
</tr>
<tr>
<td>188.</td>
<td>SOIL HEALTH CARD AND ITS IMPORTANCE TO FARMERS</td>
<td>NIKHIL RAGHUVANSHI, VIKASH KUMAR</td>
</tr>
<tr>
<td>189.</td>
<td>IMPACT OF KISAN MOBILE ADVISORY (KMA) ON AGRICULTURAL TECHNOLOGY DISSEMINATION</td>
<td>NISHA TIWARI AND KIRAN BALA</td>
</tr>
<tr>
<td>190.</td>
<td>TRAINING NEEDS OF AN EXTENSION WORKER</td>
<td>NISHA AND JYOTI RANI</td>
</tr>
<tr>
<td>191.</td>
<td>MINOR MILLETS FOR FOOD AND NUTRITIONAL SECURITY</td>
<td>NITHYASHREE, K, K. GEETHA AND NETRAVATI HIREMATH</td>
</tr>
<tr>
<td>192.</td>
<td>STUDY ON PHYSICAL PROPERTIES OF KODO MILLET (PASPALUM SCORBICULATUM)</td>
<td>NITHYASHREE, K AND K. GEETHA</td>
</tr>
<tr>
<td>193.</td>
<td>MUSHROOM FARMING TO ENSURE THE ECONOMIC SECURITY OF THE FARMER</td>
<td>NITIN SHARMA*, ISHA SHARMA² AND MANOJ KUMAR VAIDYA³</td>
</tr>
<tr>
<td>194.</td>
<td>VALUE ADDITION OF COOKIES WITH THE HELP OF BUCKWHEAT</td>
<td>NITISH KUMAR¹, ANNU YADAV², SHIVANI KHANNA³, SHALJA PANWAR³, NAresh PRATAP SINGH², REKHA DIXIT² AND NEELESH KAPOOR³</td>
</tr>
<tr>
<td>195.</td>
<td>INNOVATIONS IN FOOD PROCESSING AND PRESERVATION TECHNIQUES</td>
<td>OMPRAKASH* JAYSHREE JHALA**, KIRAN CHAUDHARY*** RAJA RAM BUNKER*</td>
</tr>
<tr>
<td>196.</td>
<td>PERFORMANCE AND DETERMINANTS OF MANGO EXPORT FROM INDIA</td>
<td>P. J. KSHIRASAGAR, S. C. PHUGE*, V. N. ANAP AND J. M. YADAV</td>
</tr>
<tr>
<td>197.</td>
<td>NUTRIENT STATUS AND THEIR RELATIONSHIP WITH SOIL PROPERTIES AT NARAYANPUR BLOCK, MIRZAPUR DISTRICT OF UTTAR-praDeSH, INDe.</td>
<td>*P. K. BHARTEEY, Y. V. SINGH</td>
</tr>
<tr>
<td>198.</td>
<td>COMPARATIVE ECONOMICS OF REJUVENATED AND NON-REJUVENATED MANGO ORCHARDS IN SOUTH KONKAN REGION (M.S.)</td>
<td>P. P. KASARE, A. C. DEORUKHAKAR, S. C.PHUGE, V.A.THORAT AND A. M.MANDAPE*</td>
</tr>
<tr>
<td>199.</td>
<td>KITCHEN WASTE COMPOSTING MODULE FOR PLANT GROWTH</td>
<td>PANKAJ CHHABRA</td>
</tr>
<tr>
<td>200.</td>
<td>FARMERS’ PERCEPTIONS TOWARDS APPLICATIONS OF MODERN FARMING TOOLS USED IN VEGETABLE PRODUCTION AT SOLAN DISTRICT, HIMACHAL PRADESH-INDIA</td>
<td>PANKAJ THAKUR*, PIYUSH MEHTA, KRISHAN KUMARAND GAURAV</td>
</tr>
<tr>
<td>Page</td>
<td>Title</td>
<td>Authors</td>
</tr>
<tr>
<td>------</td>
<td>----------------------------------------------------------------------</td>
<td>------------------------------------------------------------------------</td>
</tr>
<tr>
<td>201.</td>
<td>DRY FLOWERS: A BOON TO FLORICULTURE INDUSTRY AND ITS FUTUPE POTENTIAL</td>
<td>Parvathi Bennurmath, Sajana S, Prashant Kalal, Anamika Gurung</td>
</tr>
<tr>
<td>202.</td>
<td>STATUS OF MARKETING OF VEGETABLE IN INDIA</td>
<td>Pavan Kumar Singh, Bhartendu Yadav, Brijesh Kumar Patel, Ajeet Kumar</td>
</tr>
<tr>
<td>203.</td>
<td>ANALYSIS OF SHEET RESISTANCE VARIATION WITH STOICHEOMETRY OF CADMIUM</td>
<td>Pawan Kumar Singh, Bherendu Yadav, Brijesh Kumar Patel, Ajeet Kumar</td>
</tr>
<tr>
<td>204.</td>
<td>ADOPTION OF GOOD AGRICULTURAL PRACTICES BY MUSHROOM CULTIVATORS IN</td>
<td>Poonam Sharma, Anil Sarkar, Praveen Kumar M, Anurag Malik</td>
</tr>
<tr>
<td>205.</td>
<td>SUSTAINABLE DEVELOPMENT OF PRODUCTS FROM THE AGROTEXTILES USED IN</td>
<td>Poonam Sharma, Anil Sarkar, Praveen Kumar M, Anurag Malik</td>
</tr>
<tr>
<td>206.</td>
<td>BIO- FORTIFICATION TO ADDRESS MALNUTRITION IN INDIA</td>
<td>Poonam Sharma, Anil Sarkar, Praveen Kumar M, Anurag Malik</td>
</tr>
<tr>
<td>207.</td>
<td>MICRO-ENTREPRENEURSHIP DEVELOPMENT THROUGH FOOD PROCESSING TECHNOLOGIES</td>
<td>Poonam Sharma, Anil Sarkar, Praveen Kumar M, Anurag Malik</td>
</tr>
<tr>
<td>208.</td>
<td>ORGANIC FOOD AND HEALTH</td>
<td>Poonam Sharma, Anil Sarkar, Praveen Kumar M, Anurag Malik</td>
</tr>
<tr>
<td>209.</td>
<td>WOMEN EMPOWERMENT STATUS AND MEASURES FOR MAINSTREAMING SUSTAINABLE</td>
<td>Poonam Sharma, Anil Sarkar, Praveen Kumar M, Anurag Malik</td>
</tr>
<tr>
<td>210.</td>
<td>ROLE OF CROP DIVERSIFICATION IN SUSTAINABLE INTENSIFICATION OF AGRICULTURE</td>
<td>Poonam Sharma, Anil Sarkar, Praveen Kumar M, Anurag Malik</td>
</tr>
<tr>
<td>211.</td>
<td>CLIMATE CHANGE IN HIMALAYA, YARSHA GUMBA AND ITS IMPACT ON RURAL ECONOMY</td>
<td>Poonam Sharma, Anil Sarkar, Praveen Kumar M, Anurag Malik</td>
</tr>
<tr>
<td>212.</td>
<td>INTELLIGENT PROPERTY RIGHTS FOR USE OF GENETIC RESOURCES AND THEIR EFFECT ON LOCAL COMMUNITIES</td>
<td>Poonam Sharma, Anil Sarkar, Praveen Kumar M, Anurag Malik</td>
</tr>
<tr>
<td>213.</td>
<td>IMPORTANT PRODUCTS OBTAINED FROM BEEKEEPING</td>
<td>Poonam Sharma, Anil Sarkar, Praveen Kumar M, Anurag Malik</td>
</tr>
<tr>
<td>214.</td>
<td>THE LIVESTOCK ROLES IN THE WELLBEING AND UPLIFTMENT OF SOCIO-ECONOMIC</td>
<td>Poonam Sharma, Anil Sarkar, Praveen Kumar M, Anurag Malik</td>
</tr>
<tr>
<td>215.</td>
<td>A STUDY ON REPAYMENT BEHAVIOUR OF AGRICULTURAL LOAN BORROWERS THROUGH</td>
<td>Poonam Sharma, Anil Sarkar, Praveen Kumar M, Anurag Malik</td>
</tr>
<tr>
<td>216.</td>
<td>CONSUMERS' PREFERENCE TOWARDS DIFFERENT FRUITS OF WEST BENGAL</td>
<td>Poonam Sharma, Anil Sarkar, Praveen Kumar M, Anurag Malik</td>
</tr>
<tr>
<td>217.</td>
<td>HORTICULTURE AS A THERAPEUTIC MODALITY IN URBAN CENTERS</td>
<td>Poonam Sharma, Anil Sarkar, Praveen Kumar M, Anurag Malik</td>
</tr>
<tr>
<td>218.</td>
<td>ROLE OF MUSHROOM IN HUMAN HEALTH</td>
<td>Poonam Sharma, Anil Sarkar, Praveen Kumar M, Anurag Malik</td>
</tr>
<tr>
<td>219.</td>
<td>INNOVATIVE APPROACHES IN APPLIED SCIENCES AND SOCIO-ECONOMIC DEVELOPMENT</td>
<td>Poonam Sharma, Anil Sarkar, Praveen Kumar M, Anurag Malik</td>
</tr>
<tr>
<td>220.</td>
<td>MARKET-LED EXTENSION: ROLE OF EXTENSION AGENTS</td>
<td>Poonam Sharma, Anil Sarkar, Praveen Kumar M, Anurag Malik</td>
</tr>
</tbody>
</table>
246. RURAL WOMEN KEY TO SUSTAINABLE FOOD SECURITY
RAVI SHANKAR GIRI, VIRENDRA KAMALVANSHI, MONU KUMAR JHA, NAVNEET KUMAR SINGH AND SAKET KUSHWAHA
   96

247. ORGANIC FOODS
RENU BALA SHARMA
   96

248. MALNUTRITION GROWS IN THE SOIL: A REVIEW
RICA SRIVASTAVA 1, NEERU BALA 2, LUXMI GAUTUM 1
   97

249. IMPORTANCE OF CONSERVATION TILLAGE ON PHYSICAL PROPERTIES OF SOIL
RICA 1, MAMTA 2 AND RAMAN DEVI 1
   97

250. APPLICATION OF GREEN CHEMISTRY IN DIFFERENT FIELDS
RISHABH BHARDWAJ AND SARIKA GOEL
   97

251. IMPORTENCE OF PRADHAN MANTRI FASAL BIMA YOJANA IN AGRICULTURE SECTOR
ROHIT 1, PRAKASH SINGH 2, KAUSHIK PRASAD 1, KISHAN KUMAR 1, SHUBHENDRA KUMAR PANDEY 1, PANKAJ KUMAR SINGH 1 AND MANOJ KUMAR 1
   98

252. REVIEW OF RURAL DEVELOPMENT PROGRAMMES IN INDIA
ROHIT KUMAR GUPTA 1, NEETU SINGH 2, RAHUL KUMAR 3, J. K. GUPTA 4, J. S. GURJAR 5
   98

253. ROLE OF MASS MEDIA IN PROVIDING EDUCATION
ROHIT AND ABHILASH SINGH MAURYA
   99

254. GOVERNMENT POLICIES AND PLANNING FOR SUSTAINABLE DEVELOPMENT IN INDIA
RUBELA ABSAR
   99

255. INFLUENCE OF KNOWLEDGE ON STUDENTS IN SCHOOL VEGETABLE GARDEN AND GARDEN ACTIVITIES
S. DILIP AND ALLAN THOMAS
   99

256. JOB OPPORTUNITIES IN AGRICULTURE SECTOR THROUGH ASCI
S. K. GOYAL 1, PRABHA 2, JAI P. RAI, SHREE RAM SINGH AND A. VAISHAPAYAN
   100

257. UTILIZATION OF HONEY AS SWEETENER FOR THE PREPARATION OF COW MILK LASSI
S. M. KHUPSE 1, R. M. ZINJARDE 2 AND R. J. DESALE 3
   100

258. AN ECONOMIC ANALYSIS OF RICE BASED CROPPING SYSTEMS IN RATNAGIRI DISTRICT OF MAHARASHTRA
   100

259. EFFECT OF VARIOUS SPACING GEOMETRIES ON TREE GROWTH AND SOIL PARAMETERS IN POPLAR BASED AGROFORESTRY SYSTEM IN NORTH-WESTERN INDIA
S. B. CHAVAN AND R. S. DHILLON
   101

260. DEVELOPMENT OF CHICKEN MEAT KABABS BY USING SHATAVARI ROOT POWDER
SAIYAD AKHTAR, HARSH P. SHARMA
   102

261. SYNTHETIC AND SPECTRAL STUDIES OF COMPLEXING BEHAVIOR OF PERCHLORATO COMPLEXES OF 4 [(N-BENZOPHENONE) AMINO] ANTIPYRINE (C23H21N3O) SAKSHI CHAUDHARY
   102

262. USE OF MOBILE PHONE AMONG FARMERS FOR AGRICULTURAL DEVELOPMENT
SAKSHI SHASTRI AND ASHISH RAGHUWANSHI
   102

263. ECONOMICS OF FARMING SYSTEMS IN NAGAUR DISTRICT OF RAJASTHAN
SALITA DEVI
   103

264. ENHANCING CROP AND IRRIGATION WATER PRODUCTIVITY OF DIRECT SEEDED BASMATI RICE (ORYZA SATIVA L.) THROUGH DRIP FERTIGATION
SAMLFE TEWARI *, GURVINDER SINGH AND SUBHASH CHANDRA
   103

265. NEED FOR NATIONAL AGROFORESTRY POLICY IN INDIA
SARMINI 1, RAVINDER SHARMA 2 AND SUBHASH SHARMA 3
   103
<table>
<thead>
<tr>
<th>No.</th>
<th>Title</th>
<th>Authors</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>268.</td>
<td>ENHANCING NUTRITION OF RURAL FAMILIES THROUGH KITCHEN GARDEN</td>
<td>Sanghamitra Pradhan¹ and Kartik Pramanik²</td>
<td>104</td>
</tr>
<tr>
<td>269.</td>
<td>UP-CYCLING: THE MANAGEMENT AND CONSERVATION OF DISCARDED DENIM</td>
<td>Sangita Tomar, Vivek Singh, and Nisha Arya</td>
<td>104</td>
</tr>
<tr>
<td>270.</td>
<td>COMPARISON OF DEM'S USED FOR WATERSHED DELINEATION THROUGH ARCSWAT AN EXTENSION TOOL OF ARCGIS</td>
<td>Sanjay Tewari and Harish Chandra Sharma</td>
<td>104</td>
</tr>
<tr>
<td>271.</td>
<td>SOME PHYSICAL AND FRICTIONAL PROPERTIES OF APPLE FRUITS AVAILABLE IN MARKET OF MEERUT</td>
<td>Sanjeev Kumar Tyagi¹ and Vijai Kumar²*</td>
<td>105</td>
</tr>
<tr>
<td>272.</td>
<td>NEED OF ZERO BUDGET NATURAL FARMING FOR SUSTAINABLE AGRICULTURAL DEVELOPMENT</td>
<td>Sanjeev Singh and Adesh Singh</td>
<td>105</td>
</tr>
<tr>
<td>273.</td>
<td>STUDY THE SHELF LIFE OF PANEER AND ITS QUALITY ANALYSIS</td>
<td>Sapna Mishra*</td>
<td>106</td>
</tr>
<tr>
<td>274.</td>
<td>DEVELOPMENT OF VITAMIN FORTIFIED LOW FAT PANEER</td>
<td>Sapna Mishra*</td>
<td>106</td>
</tr>
<tr>
<td>275.</td>
<td>DIGITAL EMBROIDERY: AN IMAGINATION</td>
<td>Sarita Devi, Nirmal Yadav, Nisha Arya, and Sushila</td>
<td>107</td>
</tr>
<tr>
<td>276.</td>
<td>ROLE OF ON-LINE COMMUNICATION TECHNOLOGY IN AGRICULTURE DEVELOPMENT</td>
<td>Sarita, Ram Bharose and Pratima Tiwari</td>
<td>107</td>
</tr>
<tr>
<td>277.</td>
<td>ADOPTION AND IMPACT OF BT COTTON IN INDIA</td>
<td>Sarthak Ghimire, V. Kamalvanshi, Saket Kushwaha, Prabin Karki</td>
<td>107</td>
</tr>
<tr>
<td>278.</td>
<td>ROLE OF KISAN CREDIT CARD SCHEME IN INDIA</td>
<td>Satendra Kumar¹, V. K. Singh²</td>
<td>108</td>
</tr>
<tr>
<td>279.</td>
<td>PRODUCTION PERFORMANCE OF POULTRY GENOTYPES UNDER TRADITIONAL SYSTEM OF REARING IN KONKAN REGION OF MAHARASHTRA</td>
<td>Satish Jadhao¹, A.J. Mayekar¹, Shalu Kumar³*, B.G. Desai¹, J.S. Dhekale² and N.N. Prasade¹</td>
<td>108</td>
</tr>
<tr>
<td>280.</td>
<td>ZERO BUDGET NATURAL FARMING (ZBNF)</td>
<td>Satyam Kumar Mehta</td>
<td>108</td>
</tr>
<tr>
<td>281.</td>
<td>USE OF MOBILE APPLICATIONS IN MODERN AGRICULTURE</td>
<td>Seema Kasotiya¹*, Kumari Lata², Manju Verma¹, Bhagwati Baranda⁴</td>
<td>109</td>
</tr>
<tr>
<td>282.</td>
<td>ICT IN AGRICULTURE: A ROAD TO DOUBLING THE FARMERS' INCOME</td>
<td>Shah Amir</td>
<td>109</td>
</tr>
<tr>
<td>283.</td>
<td>BAMBOO SHOOTS: MYRIAD OF BENEFITS</td>
<td>Shikha and Rashmi Singh</td>
<td>110</td>
</tr>
<tr>
<td>284.</td>
<td>EFFECTIVENESS OF AGRICULTURAL PROGRAMMES ON TELEVISION AS PERCEIVED BY THE TELEVIEWING FARMERS</td>
<td>Shinde V.M.¹, Kale Neha. D.²*, Gholapec S.M.³, and Sawant P. A.⁴</td>
<td>110</td>
</tr>
<tr>
<td>285.</td>
<td>A SURVEY OF INVASIVE ALIEN ANGIOSPERM SPECIES OF J. P. NAGAR OF ROHILKHAND REGION, INDIA</td>
<td>Shiv Pratap Singh* and Beena Kumari</td>
<td>110</td>
</tr>
<tr>
<td>286.</td>
<td>USE OF MEDIA PACKAGE FOR ASSESSING THE ACCEPTANCE OF BIOGAS TECHNOLOGY BY RURAL WOMEN</td>
<td>Shobha Rani* and Devendra Kumar**</td>
<td>111</td>
</tr>
<tr>
<td>287.</td>
<td>INNOVATIVE APPROACHES IN APPLIED SCIENCES AND SOCIO-ECONOMIC DEVELOPMENT</td>
<td>Shristi Sonal</td>
<td>111</td>
</tr>
<tr>
<td>288.</td>
<td>KITCHEN WASTE COMPOSTING: A GREEN APPROACH IN WASTE MANAGEMENT FOR SUSTAINABLE DEVELOPMENT</td>
<td>Shweta Chaudhary* and Sunita Mishra**</td>
<td>112</td>
</tr>
<tr>
<td>289.</td>
<td>GEOINFORMATICS FOR THE PHYSIOGRAPHIC AND LAND USE/LAND COVER MAPPING OF SIWANI AREA, BHIWANI DISTRICT (HARYANA)</td>
<td>Simmi Rajput</td>
<td>112</td>
</tr>
<tr>
<td>290.</td>
<td>FACILITATING SUSTAINABLE AGRICULTURE BY STRENGTHENING INDIGENOUS TECHNICAL KNOWLEDGE</td>
<td>Smriti Singh¹, Neha², Sandeep Yadav³ and Prakriti Tomar⁴</td>
<td>112</td>
</tr>
<tr>
<td>No.</td>
<td>Title</td>
<td>Authors</td>
<td>Page</td>
</tr>
<tr>
<td>-----</td>
<td>----------------------------------------------------------------------</td>
<td>-------------------------------------------------------------------------</td>
<td>------</td>
</tr>
<tr>
<td>291.</td>
<td>GROUNDWATER RESOURCE ESTIMATION USING GEC 2015 METHODOLOGY IN BEMETARA BLOCK, DISTRICT BEMETARA, CHHATTISGARH</td>
<td>Sonal Chourasia*, P. K. Naik, A. V. S. S. Anand</td>
<td>113</td>
</tr>
<tr>
<td>292.</td>
<td>PCOS: A REVIEW OF THE CURRENT KNOWLEDGE</td>
<td>Sonali Dua, Shobha Mehta</td>
<td>113</td>
</tr>
<tr>
<td>293.</td>
<td>TRAINING NEEDS OF YOUNG RURAL GIRLS IN SELECTED VOCATIONS</td>
<td>Sonika Sharma1 and Devendra Kumar Meena2</td>
<td>113</td>
</tr>
<tr>
<td>294.</td>
<td>REDUCING POST HARVEST HANDLING AND MAINTAINING QUALITY IN AGRICULTURAL PRODUCE MARKETING</td>
<td>Soniya Ningombam</td>
<td>113</td>
</tr>
<tr>
<td>295.</td>
<td>IMPROVING SOCIOECONOMIC STATUS OF RURAL WOMEN THROUGH MUSHROOM CULTIVATION</td>
<td>Soumya Ranjan Behera1 and Jhunilata Bhuyan2</td>
<td>114</td>
</tr>
<tr>
<td>296.</td>
<td>OBSERVATIONS ON ZOOPLANKTON COMMUNITY OF NANAK SAGAR RESERVOIR, UTTARAKHAND</td>
<td>Sumit Kumar, Malobica Das Trakroo, Kusumlata Goswami and Hema Tevari</td>
<td>114</td>
</tr>
<tr>
<td>297.</td>
<td>ROLE OF MASS MEDIA IN ORGANIC FARMING</td>
<td>Sumit Kumar Gupta and Dan Singh1</td>
<td>115</td>
</tr>
<tr>
<td>298.</td>
<td>ATTITUDE OF POST GRADUATE STUDENTS OF JUNAGADH AGRICULTURAL UNIVERSITY TOWARDS AGRICULTURAL ENTREPRENEURSHIP</td>
<td>Suraji Yugender Reddy1 and M. S Chandawat2</td>
<td>115</td>
</tr>
<tr>
<td>299.</td>
<td>IMPORTANCE OF SOIL HEALTH AND QUALITY AND HOW TO IT IMPROVE</td>
<td>Suresh Kumar1, Sunil Kumar Gora2, Prawin Kumar1</td>
<td>115</td>
</tr>
<tr>
<td>300.</td>
<td>WATER SECURITY PLANNING FOR SARUA MICRO-WATERSHED, PRATAPGARH, UTTAR PRADESH USING SCS-CN METHOD</td>
<td>Susheel Kumar Patel, Dinesh Kumar Sharma</td>
<td>116</td>
</tr>
<tr>
<td>301.</td>
<td>DEVELOPMENT OF ANTIMICROBIAL FINISH USING LEMON PEELS EXTRACT</td>
<td>Sushila, Nisha Arya, Neenu Poonia, and Sarita Devi</td>
<td>116</td>
</tr>
<tr>
<td>302.</td>
<td>INNOVATIONS IN NATURAL COLOR EXTRACTION TECHNIQUES IN FOOD INDUSTRY</td>
<td>Sushree Titikshya1, Vivek Kumar2, S. N. Naik3</td>
<td>116</td>
</tr>
<tr>
<td>303.</td>
<td>MNREGA: CONSTRAINTS OF WOMEN EMPOWERMENT IN PURABAZAR BLOCK OF FAIZABAD DISTRICT, UTTAR PRADESH</td>
<td>Swati Chaturvedi1, R.K. Doharey, Dan Singh, V. B. Singh, and Smriti Singh</td>
<td>117</td>
</tr>
<tr>
<td>304.</td>
<td>POTENT UNDERUTILIZED LEAFY VEGETABLE PLANTS FOR NUTRITION AND HEALTH FROM BAHRAICH (UP) INDIA</td>
<td>T. P. Mall</td>
<td>117</td>
</tr>
<tr>
<td>305.</td>
<td>THE CONCEPT OF AGRO-TOURISM: EVOLUTION AND TRENDS</td>
<td>Tanvi Khurana1 and Suman Singh2</td>
<td>117</td>
</tr>
<tr>
<td>306.</td>
<td>MORPHOMETRIC ANALYSIS OF KOYNA RIVER BASIN USING REMOTE SENSING AND GIS TECHNIQUES</td>
<td>Tarate Suryakant Bajirao1, Pravendra Kumar1 and Anil Kumar1</td>
<td>118</td>
</tr>
<tr>
<td>307.</td>
<td>HYDROCOLLOIDS AS FOOD</td>
<td>Tarun Kumar*, Suresh Chandra, Samsheer, Jaivil Singh, Neelesh Chauhan, Ankur M. Arya and Kapil Kumar</td>
<td>118</td>
</tr>
<tr>
<td>308.</td>
<td>POTENT WILD EDIBLE FRUIT PLANTS FOR NUTRITION AND HEALTH FROM BAHRAICH (UP) INDIA</td>
<td>T. P. Mall</td>
<td>119</td>
</tr>
<tr>
<td>309.</td>
<td>PERSPECTIVE OF AGRICULTURE GIRL STUDENTS TOWARDS HIGHER EDUCATION</td>
<td>Unmesha PrajnaShree1, V. K. Singh2, Gargi Paliwal3</td>
<td>119</td>
</tr>
<tr>
<td>310.</td>
<td>RESOURCE MANAGEMENT: A KEY FACTOR FOR SUSTAINABLE AGRICULTURE</td>
<td>Uttam Chand</td>
<td>120</td>
</tr>
<tr>
<td>311.</td>
<td>INTEGRATED FISH FARMING TECHNOLOGY: WAY TOWARDS SOCIO-ECONOMIC UPLIFTMENT AND WOMEN EMPOWERMENT IN RURAL AREAS OF WEST KAMENG DISTRICT ARUNACHAL PRADESH, N. E. R, INDIA</td>
<td>V.K. Misra1, C.P. Singh2, N.D. Singh1 T.S. Mishra1, N.K. Mishra1, A.N. Tripathi1 and Shashank Singh1</td>
<td>120</td>
</tr>
<tr>
<td>312.</td>
<td>HEAVY METALS IN COSMETICS: DISTRIBUTION AND POSSIBLE HARMFUL EFFECTS ON HUMAN</td>
<td>Veena Chaudhary</td>
<td>120</td>
</tr>
</tbody>
</table>
AN ANALYSIS OF CROPPING PATTERN IN MALAPRABHA PROJECT COMMAND AREA
VEERESH WALI AND RAJENDRA PODDAR

ROLE OF WOMEN IN SERICULTURE
VENKATASAIKIRAN GUBBALA

RURAL LIVELIHOOD AND DEVELOPMENT IN ALLIED SECTOR ROLES, INTER-LINKAGES AND SIGNIFICANCE OF NON-FARM SECTORS IN BOOSTING RURAL ECONOMY OF INDIA: DOUBLING THE FARMER'S INCOME
VIKASH KUMAR1, SURJYAKANTA ROY2 AND AVINESH SHARMA3

IMPACT OF ASCT IN AGRICULTURE AND ALLIED INDUSTRIES
VIKASH

ADOPTION OF FARMERS ABOUT IMPROVED GINGER (ZINGIBER OFFICINALE L.) PRODUCTION TECHNOLOGY IN UDAIPUR DISTRICT OF RAJASTHAN
VIKAS KUMARI1 AND S. S. SISODIA2

EFFECT OF PRESERVATION TECHNIQUES ON FOOD QUALITY
VIKRANT KUMAR*, JAIVIR SINGH, SURESH CHANDRA, SUNIL, RATNESH KUMAR, VIPUL CHAUDHARY

STUDY OF ANTI-INFLAMMATORY ACTIVITY OF SOME SUBSTITUTED CHROMONES
VINAY PRABHA SHARMA

INDIAN DAIRY INDUSTRY
VINOD BHATESHWAR1, PANKAJ2 AND SANTOSH SHIVRAN3

PROFILE CHARACTERISTICS OF ARECANUT GROWERS OF UTTARA KANNADA DISTRICT
VINODA SHANKARA NAIK1 AND S. L. PATIL.2

IMPACT OF FOOD WASTAGE ON CARBON FOOT PRINT
VISHAKHA SHARMA AND GITANJALI

CONTRACT FARMING-PROSPECTS AND CHALLENGES IN INDIA
Y. VINAY KUMAR1, SWATI SHARMA2, BHAIVESH D. CHAUDHARI3

RURAL YOUTH EMPOWERMENT OF INDIA THROUGH USE OF ICT
YERAGORLA VENKATA HARIKRISHNA, SABYASACHI PRADHAN AND SEEMA NABERIA

SOCIO-ECONOMIC STATUS OF BT COTTON’S FARMER IN INDIA
YOGESH KUMAR, NAVNEET KUMAR SINGH, VIVEK PRATAP SINGH

AGRIBUSINESS IN INDIA: SCOPE, OPPORTUNITIES AND CHALLENGES
YUDHISHTHER SINGH BAGAL*, RAKESH NANDA AND RASHIKA MAHAJAN
ABSTRACTS

THEME-4

INNOVATIVE APPROACHES IN APPLIED SCIENCES AND SOCIO-ECONOMIC DEVELOPMENT
PACKAGING ADDS VALUE TO AGRI PRODUCE: A SUSTAINABLE APPROACH

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ABSTRACT

In recent time there are several incidents of farm distress are reported in several parts of country and there have been reports of price crashes in case of farm produce, such as tomatoes, mangoes, sugarcane and onion etc. In some cases, farmers have dumped their produce on roads. Produce such as fruits and vegetables are perishable and therefore have a short shelf life. Further, due to inadequate storage facilities and poor food processing infrastructure farmers have limited options but to sell the produce at prevailing market prices. This can lead to distress sales or roadside discards (in some cases to avoid additional cost of transportation). It is also observed there is increase in-put cost for farm production. Food packaging including Agri produce is regarded as such a strategic product service system since it adds value to consumers both in the first and the second moments of truth. Through out the supply chain, the package is the interface between the product and the consumer and adds values in terms of information, usability, marketing, functionality and recyclability, among others. The role of food packaging as a value adding element and interface to the product, the package also has a function of adding values to other actors of the food supply chain. Such values could be information, handle ability, stackability, etc., in the different parts of the chain. Packaging has become increasingly important as a value addition of product, since package design influences the consumer’s experience of product use as well as accelerating and affecting the first purchase decision. In recent time there are several incidents of farm distress are reported in several parts of country and there have been reports of price crashes in case of farm produce, such as tomatoes, mangoes, sugarcane and onion etc. In some cases, farmers have dumped their produce on roads. Produce such as fruits and vegetables are perishable and therefore have a short shelf life. Further, due to inadequate storage facilities and poor food processing infrastructure farmers have limited options but to sell the produce at prevailing market prices. This can lead to distress sales or roadside discards (in some cases to avoid additional cost of transportation). It is also observed there is increase in-put cost for farm production. Recent research in food packaging has resulted in technological innovations that provide information on the real shelf life and expiration of food products as a service to users. These product-service innovations present an added value to consumers and also a clear benefit from a sustainability perspective, but they are beneficial for all stages of the supply chain. This manuscript presents a study with the purpose to elaborate the value of food packaging innovations. The paper discusses the technological innovation and its potential value addition.

Keywords: Packaging, value addition, product-package-service system, supplies chain.

PROLOGUE

Role of Packaging in the Food Supply Chain

When it comes to food products, packaging is a valuable aid in providing safe food to consumers. Food supply chains are both time critical due to temperate storage requirements and dynamic due to variance in raw material supply and quality. Even though food safety has a high priority on the food producers’ agenda, the food industry has become global and more complex. This means that there are longer distances from the production of food to the consumer. This certainly places higher demands on food safety matters and on the process of guaranteeing safe food to consumers. Although complex, food supply chains can be generalized into certain steps from crop, to production and consumption. Typical steps in these complex food supply chains are agriculture, food manufacturing, food wholesaling, food retailing and, food services. The trend among consumers for fresh products has resulted in chilled food, particularly prepared chilled food, now competing more and more with their frozen counterparts. These new trends and lifestyles place strict requirements on new food products for a safe and quality controlled distribution. In order to highlight safety and quality, temperature control is an important issue in chilled food distribution.

VALUE ADDITION

Packaging offers additional functional values, such as better branding, elements that fight counterfeiting and protection of the formulation within. As consumers demand more of their products and brands, companies have to be prepared to work more with their suppliers and product developers to create this value for their consumers. In , there are two constants in packaging: it must be functional and attractive. It must effectively contain and dispense the product while also engaging consumers from the shelf, enticing them to pick up this product instead of the one next to it. However, increasingly, packaging is becoming integral to the use experience of a product, and these added value elements are making collaboration between packaging suppliers and brands that much more important, as well. Packaging needs to evolve to help display innovative products. According to Damien Dossien (2016), “If a product is innovative, the packaging may have to be as well,” Inc. “In the consumer’s eyes, packaging and product are inextricably intertwined.” Value is what is perceived by the consumer. When a consumer looks at the value of a product they consider a few things, the quality of the product vs the price.
Role of Packaging in Brand Identification

Majority of today's consumers are very busy people, they zip into the store to get what they need and get out. Most purchase decisions are made within 30 seconds. So, ultimately you have less than 30 seconds to 1) get the consumers attention, 2) get them to pick up product and 3) get them to make the purchase decision of buying product as opposed to competing brands. Most purchase decisions are made within 30 seconds. Product packaging is the focus here of getting attention and the first step of the process to getting the purchase. Firstly, having a product in packaging that resembles brand and what brand stands for is a great way to start. For example, if you have an eco-friendly product, use that as a selling point and make sure those products characteristics are carried through to packaging. If brand / product has multiple variations it is important to ensure that the same brand image and message is carried throughout entire product line. This makes it easier for the consumer to establish brand and also aids in repeat sales. When the consumer recognizes brand and has a sense of trust, they are more likely to purchase other products, knowing that other products will (should) carry the same quality.

Packaging as a Tool for Advertising at the Point of Purchase

After the consumer has identified brand / product its now time to get them to make that purchasing decision and influence them in doing so. A packaging carton is most efficient in this as it allows you to add additional information that cant fit on the actual product; information that could influence them to purchase product. In today's modern world where we are so busy and thrown with various advertising media from every angle, we have become oblivious to them out. Think about D Stv or the American Cable TV where you just fast forward through the adverts or let them play while you go get something to drink. Consumers are increasingly becoming immune to advertising.

Modern world of Packaging for Product Transport

Now that the consumer has purchased product, can they transport it easily? The easier product is to transport the better value it creates to the consumer. The ease of transport is unfortunately often overlooked and the consumer has to take the hit for it.

Role of Packaging to maintain Food Quality and Shelf life

The shelf life of food products is an indicator of the level of quality. All food products in Sweden have to be marked with either “best-before date” or “last date for consumption”. The latter is used for more sensitive food like fresh meat, fish and chicken. The best-before date is set so that the food, if stored under the right conditions and in an unbroken package, will be possible to consume some additional time after the set date. Since food producers have to add a safety margin to the best-before date, this results in an unnecessary waste of food, both by the consumers in their home and at retail locations. The majority of consumers tend to throw away food when the best-before date has expired, irrespective of if the food has gone bad or not. Consumer behaviour in retail stores also creates waste. Since consumers buy products with the longest remaining shelf life irrespective of whether the product is going to be consumed the same day or not. This generates waste of products with shorter shelf life since they remain on the shelves. The two most important factors concerning the shelf life of a product are time and temperature. Most of the deteriorating changes that take place in food are temperature dependent and occur at a slower rate at lower temperatures. When temperature is infringed upon, the shelf life is affected leading to an uncertainty of the quality and food safety. There have been some initiatives on the market to make indicators for detecting products that have been exposed to higher temperatures than stipulated. These indicators, however, have only been able to indicate if a product has been exposed to higher temperatures, but not how long. They usually shift in colour if the product has been exposed, but they really do not say much since the exposure is also dependent on time.

CONCLUSION

Agricultural packaging is essential to the food industry. Packaging prevents food from being spoiled or ruined by pests or toxins from packages. In a health conscious world demand is to know where our food comes from. Agricultural packaging has taken on a new level of importance considering that 54% of wasted food is lost during the production process, after-harvest treatment, and storage transportation. Discover more about five important agricultural packaging products from wholesale to retail. Some packages may not hold up very well, and may become susceptible to pests or the external elements such as wet weather. For these reasons, bulk bags are one of the most affordable and effective ways to store and transport dry goods and produce. Consider the packaging best used for agricultural bulk shipping. It’s really important to understand the importance of agricultural packaging for better business for the short and long term. Packaging within the agricultural industry will help to preserve and protect farm produce. It will save money on shipping costs and will aid in product branding. Plus, utilizing the right agricultural packaging is essential in delivering the freshest, best-looking products and add value to the product.
CARBON NANOTUBES: SYNTHESIS, CHARACTERIZATIONS AND ITS POTENTIAL APPLICATIONS

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Miniaturization is the general aim of current technology and it is taking place in nearly all types of technology. In nature, there are some pure materials that have striking different properties even though they are made of the same atoms. For example, diamond and graphite are two pure forms of carbon called allotropes and frequently used in jewellery and in pencils respectively. These two materials have enormously different properties such as graphite is light, flexible, soft, and conducts electricity whereas diamond is an exceptionally hard, strong and does not conduct electricity. Both of these materials are made up of carbon atoms and attached through strong covalent bonding. But in graphite each carbon atom uses three out of four electrons to form three single bonds with its neighbours and forming a linear sheet, whereas in diamonds each carbon atom uses all its four electrons to form four single bonds and resulting in a 3-D structure. In the early 1990s, an exceptionally new form of carbon namely Carbon Nanotubes (CNTs) was first discovered by S. Iijima. CNTs are seamless hollow cylinders of covalently bonded carbon atoms. The carbon atoms in the walls of a tube are arranged in a honeycomb lattice just as in a single sheet of graphene. These are found as single wall carbon nanotubes (SWCNTs), double wall carbon nanotubes (DWCNTs) and multi wall carbon nanotubes (MWCNTs). SWCNTs is a single cylinder of carbon atoms which is typically 0.5–4nm in diameter and several micrometer (μm) in length whereas MWCNTs consist of concentric SWCNTs (or shells) stacked together and having diameters in the range of 20–80nm and several tens of micrometer in length. MWCNTs were first synthesized by using arc discharge technique where fine threads in a bit of shoot were observed under electron microscope. The tresses were very thin and long tubes of pure carbon. SWCNTs were synthesized, using metal catalyst in arc-discharge method, for the first time, by Iijima and Ichihashi and Bethune et al. in 1993. SWCNTs can only be grown in presence of a catalyst whereas MWCNTs do not need a catalyst for growth. Generally, three techniques are being used for producing CNTs: (i) Arc-discharge technique (ii) Laser ablation technique and (iii) Chemical vapor deposition (CVD) technique.

The properties of CNTs are derived from the properties of graphene. Depending on the “rolling” angle or chiral angle with respect to the lattice, the corresponding arrangement of the atoms in the walls of the CNT with respect to the CNT axis is totally different. The angle between the orientation of the lattice and the CNTs axis is known as the “chirality” of the CNT. CNTs specifically SWCNTs have a wide range of unexplored potential applications in various technological/industrial areas such as aerospace, energy, automobile, medicine and chemical industry. In these applications, CNTs can be used as gas adsorbents, templates, composite reinforcements, actuators, probes, sensors, nano-reactors, catalyst supports, nano-pipes etc. However, the industrial application of the carbon nanotubes requires the development of techniques for large-scale production of defect-free nanotubes. The sensing applications of SWCNTs cover environmental monitoring, food quality observation, defence area, fire detection and other safety measures. Different pollutants releasing in the environment require continuous monitoring by different kind of sensitive sensors. Gas sensors are the indispensable part of our modern technology and are being much focused by scientific community. There is large number of sensors available in the market and among all sensors, metal oxide based gas sensors work efficiently but they lack the high quality of selectivity and operate at high temperature consuming much energy. To overcome these limitations of metal oxide based sensors, CNT and specifically SWCNTs based sensors are showing excellent performance in sensitivity and selectivity at room temperature. At present, we are working on SWCNTs based sensors. In our laboratory, SWCNTs have been grown on Fe catalyst deposited on Si substrate by PECVD technique at an operating temperature of 600°C. Then, SWCNT sensor was fabricated for NH₃ sensing at different operating temperature and concentration. The performances of the fabricated SWCNTs based sensor have been measured at 30°C, 100°C and 200°C and we have achieved the sensor response 35%, 25%, and 20% respectively. The response have also been investigated by varying NH₃ gas concentrations as 10ppm, 20ppm and 30ppm and the sensor response was observed at 4%, 8% and 15% respectively showing almost a linear behaviour with increasing gas (NH₃) concentrations. In our study, different sensor characteristics such as sensor response, repeatability, selectivity, and long-term stability have been investigated and it has been observed that SWCNTs based gas sensor has shown excellent performances towards these characteristics.
AGRICULTURE WASTEWATER: POTENTIAL SUSTAINABLE SOLUTIONS

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Oil palm production plays a significant role in Malaysia economic growth. Malaysia currently accounts for 29% of world palm oil production and 37% of world exports. Besides the overwhelming growth of this industry, a substantial generation of waste is also generated. The discharge of partially treated or untreated agriculture wastewater into water bodies creates severe environmental pollution. High organic compounds in the wastewater easily decompose and deplete the dissolved oxygen in water, results in threatening the aquatic life and also affecting human activities. The current study focussing on few potential solutions applying sustainable membrane technology. The integrated approach for Palm Oil Mill Effluent (POME) treatment combining the pretreatment and membrane processes was tested on a pilot plant scale. The overall performance of integrated treatment system gave 100% reduction in suspended solids and oil & grease content, 99.5% reduction in COD and 99.6% reduction in BOD. The 81.2% of water present in POME was successfully recovered as high-quality water through this system. The sludge generated from the coagulation-flocculation process could be further treated into fertilizer. This integrated treatment system could be an attractive alternative for conventional POME treatment as it promotes an environmental friendly treatment with zero discharge concepts. Membrane distillation system was also being thoroughly studied and producing promising results for the mass production application.

Keywords: Palm oil mill effluent, integrated membrane treatment system, membrane distillation

PAINTOSORP™ AS AN ADSORBENT AND ITS REGENERATION

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Adsorption considered to be one of the effective methods for the removal of pollutant such as dyes from wastewater. However, the adsorbent cost is one of the disadvantages of this process. For this purpose, low cost adsorbents have been used such as clay-based adsorbents. But, the disposal of these spent adsorbents can lead to the leaching of adsorbate into the environment. Therefore, regeneration of adsorbents is also a matter of concern which can reduces the problem of generated waste and decreases the overall cost of treatment. Clay-based adsorbent coating named as Paintosorp™ is newly formulated adsorbent and effectively remove Methylene blue with an adsorption efficiency of 99%. In this study regeneration of Paintosorp™ has been performed using different solvents and to know their role for desorption of methylene blue dye from adsorbent.

Keywords: Adsorption, clay adsorbent, regeneration, solvent, Paintosorp™, Methylene blue

IMPACT ASSESSMENT OF FARMERS FAIR AT UNIVERSITY LEVEL

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Kisan Mela is an important mass contact method in extension teaching. It is an organized educational activity for involving and educating farmers by bringing together the farmers, scientists, extension workers, input agencies, developmental departments and non-governmental agencies on agriculture or allied aspects at a Research Station or an agriculturally important educational centre, where the farmers can see, interact and gain first hand knowledge about the latest technologies and developments in agriculture and allied aspects. It integrates several educational activities specifically directed to the farmers of a region, state or country. At present there has been increasing demand for organising such Kisan Mela at different levels. Hence, it is appropriate to study the impact assessment of Farmers fair at university level. Keeping in view of the above fact, a study was conducted at Rajendra Agricultural University, Bihar where Kisan Mela was organized from 5-7th March, 2016 (three days) with involvement of 120 randomly selected participating farmers. The findings indicated that maximum numbers of participants were middle age group, had matriculation level of education, development level of education, belong to OBC category, untrained with small land holding and agriculture and subsidiary was major occupation. Good majority of participating farmers perceived that information received at Kisan Mela on Agricultural implements & machine, IFS, Dairy & AH, Mushroom Cultivation and Medicinal & Herbal planting were more useful. It was also observed that more than fifty percent of the respondents expressed their opinion suggestions by experts, Kisan Gosthi and horticultural exhibition were very good. Most of them opinion on sale of inputs, transport arrangement and food facilities in farmers fair were average.
REMOVAL OF METAL IONS AND DETOXIFICATION OF RECALCITRANT ORGANIC DYES BY HYDROGELS

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The adulteration of water by dyes and heavy metal ions is a very critical environmental issue and as such vast amount of efforts are invested to prioritise the synthesis of the unique and efficient adsorbent systems with high sorption capacity and at the similar time achieving a major goal to lessen their non-biodegradable and toxic nature. Removal process and detoxification of recalcitrant organic dyes and Heavy metal ions has been done in many ways; however adsorption methods are usually appropriate due to their ease of operation and economical value. Various adsorption techniques as such have been taken into consideration like sawdust and additional wood variety materials, husk obtained from rice, waste products from petroleum, waste products obtained from fertilizers, fly residue, sugar manufacturing industrial wastes, Chitin hydrolysis products and seafood processing wastes, various types of clays and zeolite compounds etc. however; hydrogels with high sorption capacity, high functionality, hydrophilicity, regeneration and nontoxicity have made them a good contender for the removal of various aquatic pollutants including heavy metal ions. Moreover, certain modifications in synthesis of hydrogels, to customize them in response to different stimuli like temperature, pH and ionic strength; has added an advantage in waste water treatment. The present review provides recent progress in the synthesis of the hydrogels for waste water treatment and insight into increase in selectivity, efficiency and reusability of hydrogels.

Key words: hydrogels, synthesis, application, dye, heavy metal ions

CHEMICAL MODELS OF CYTOCHROME P450 IN DRUG METABOLISM

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Most of the drugs are metabolised by cytochrome P450 in the liver of human and other animals. Primary metabolites of drugs contribute to the efficacy, side effects and toxicity of parent drugs. Drug metabolisms have been studied by using purified enzymes. Since isolation and purification of membrane bound cytochrome P450 in large amounts for metabolic studies are laborious and costly processes, therefore the chemical models of cytochrome P450 have been developed and applied in the oxidative metabolism of selected compounds in different reaction conditions.

INTRODUCTION OF BROCCOLI CROP IN RAINFED CONDITION UNDER NICRA VILLAGES OF BUNDELKHAND REGION

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Broccoli (Brassica oleracea L.var. italica) is more resembling with cauliflower and it is vitamin rich winter vegetable. This is the most widely famous grown vegetable in the temperate and sub-tropical zones. Broccoli comes in the Brassica group and the head comprising unopened green flower bud clusters along with part of fleshy stem. Broccoli is environmentally better adapted and can tolerate comparatively high temperature than cauliflower. It is fairly rich in carotene and ascorbic acid and contains appreciate quantities of thiamin, riboflavin, and iron. In this study in NICRA villages (Gandhinagar and Birgua comes under in Block- Badagaon, Jhansi) broccoli nursery was grown in nursery in the last week of October at Krishi Vigyan Kendra, Jhansi and seedlings was distributed to 16 farmers in the first week of December in Rabi 2017 which has less land holding, to generate high income from the produced. The plants are planted at a spacing of (50X30) cm at farmers field and K.V.K, Jhansi also. It was observed that Broccoli performed well in Rainfed condition of bundelkhand region and having no problems of any type of disease, insect-pest or physiological disorders also there is a strong consumer demand in the market but the production was low as compare to other climatic regions. The average yield of farmers field was about 20.5 qt/ha.

Keywords: Broccoli, Regions, NICRA and Crop.
FLORISTIC COMPOSITION CHANGE REPORTED AS A RESULT OF GRAZING AT SELECTED SITE (GRAZED SITE-YOUSMARAG) IN KASHMIR VALLEY, INDIA

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In the Indian Himalaya, the grasslands occupy about 35% of the geographical area. The different types of the Himalayan grasslands include the warm temperate grasslands, cold temperate and subalpine grasslands, alpine meadows, the steppes of cold-arid regions, and the alpine scrub. Although, they differ from one another in terms of origin, structure and composition; nevertheless they all support a large number of wild herbivores, domestic livestock, and agro-pastoral activities. Kashmir Valley has vast land area (16%) under grasslands which play an important role in providing economic goods and ecosystem services to the society. Livestock, particularly the migratory flocks, are entirely dependent on these grasslands. Apart from sustaining this pivotal economic activity, grasslands harbor a rich and endemic biodiversity, and regulate the regional carbon, nutrient and hydrological cycles. The data pertaining to Grazed site (Yousmarag) revealed the presence of twenty four herb species in spring season, the highest density was shown by Cynodon dactylon (415800 ha\(^{-1}\)), maximum frequency (100%) was observed by Achillea mill folium and highest abundance was reported in Cynodon dactylon (554200 ha\(^{-1}\)). In autumn season, maximum density and abundance was reported in Cynodon dactylon (554200 ha\(^{-1}\)). The maximum frequency (100%) was observed in Cynodon dactylon while maximum abundance was reported in Cynodon dactylon (554200 ha\(^{-1}\)). A total of nineteen herbs species were found in autumn season amongst the twenty four species reported at this site. Maximum density was recorded in Cynodon dactylon (284100 ha\(^{-1}\)), maximum frequency (100%) were recorded in Cynodon dactylon, while highest abundance was reported in Cynodon dactylon (284100 ha\(^{-1}\)). In all three seasons, it was observed that Cynodon dactylon had maximum importance value index (IVI). IVI for Cynodon dactylon was maximum in autumn (64.20 ha\(^{-1}\)) season followed by summer (58.42 ha\(^{-1}\)) and minimum was in spring (39.39 ha\(^{-1}\)).

**Keywords:** grasslands, grazing, density, frequency and importance value index (IVI).

WHEAT YIELD FORECASTING IN HARYANA: A TIME SERIES APPROACH

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India is an agrarian country in which Agriculture is the single most important contributor to the Indian economy because of its significance in food security, trade and industry. Wheat is the most important food grains of human in India. Wheat crop is India’s prime most staple harvest, placed after Rice. It is mostly consumed in the north and north-west parts of the country. At the time of independence in 1947, production and productivity of wheat were quite low at 6.46 million tones and 663 kg/hectare respectively. At present, India is the second largest producer of wheat in world after China. The purpose of this study was to fit a model that forecast the yield of wheat in Haryana by using annual time series data from 1980-81 to 2009-10. Random walk, random walk with drift, linear trend, moving average, simple exponential smoothing and ARIMA models were employed and compared for finding out a best model to forecast the yield of wheat in Haryana. A software Statgraphics is used to forecast the time series data. The best fitted model was selected based on performance in goodness of fit criterion; Akaiike Information Criterion (AIC). This study found that on the basis of AIC, ARIMA(0,2,2) be the best model to forecast wheat yield in Haryana. The forecast value of yield was obtained as 4620.91 kg/hectare in 2017, 4669.28 kg/hectare in 2018, 4717.64 kg/hectare in 2019, 4766 kg/hectare in 2020, 4814.37 kg/hectare in 2021 and 4862 kg/hectare in 2022.

**Keywords:** ARIMA; Time Series Models; Forecast; Wheat yield; Exponential smoothing.

RESOURCE USE EFFICIENCY OF CHICKPEA PRODUCTION IN HAMIRPUR DISTRICT OF UTTAR PRADESH

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Chick Pea is one of the major pulses cultivated and consumed in India. It is a major and cheap source of protein. In the country, chickpea accounts for about 45 percent of total pulses produced. It makes up more than 20 percent of world pulse production. Chickpea is most important pulse crop of India in terms of both area and production. The study of resource productivity; resource use efficiency and optimum resources used with respect to various explanatory variables in chickpea was undertaken on small medium farm during agricultural year 2017-18 Hamipur district of Uttar Pradesh. The data was

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taken from cost of cultivation primary and secondary data collection the sample of 100 small medium farm size farmers throughout the district was tabulated and analyzed by appropriate statistical tools. The results revealed that partial regression co-efficient of human labour was 0.553 followed by that area under chickpea was (0.579) positive at 1 per cent level and partial regression co-efficient of nitrogen and machine labour were positive but non-significant. Marginal product of area under chickpea was 3.242 quintals followed by that of bullock labour (0.132 q), plant protection (0.197q) and human labour (0.231). MVP to price ratio with respect to potash was 9.87 followed by seed (7.37), human labour (2.90) and area under chickpea (2.31). Optimum use of area under chickpea was found to be 1.24 hectare and optimum use of human labour was 52.29 man days.

Keywords: Chickpea, Resource productivity, Resource use efficiency, optimum resources

AN INNOVATIVE APPROACH FOR ECO-FRIENDLY BEEKEEPING IN UTTARAKHAND, INDIA
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The utilization of cow urine for disease pest management has been utilized and appraised in vedic and holy text books since ages. Cow urine and its plant based decoctions have been successfully utilized for disease and pest management in beekeeping. The cow urine applied @ 50-100% in bee colonies gave cent per cent recovery against bacterial disease, European foul brood of honey bee in 3-4 weeks interval, with comparable results in chemical (Terramycin) treated bee colonies. There was significant reduction in brood mite infestation (72.10%) in cow urine @ (100%), while followed by neem leaf powder @ 5g/hive (71.35%), jatropha leaf powder @ 5g/hive (69.47%) and (51.11%) in case of thymol @ 500mg/hive treated bee colonies. The utilization of smoke generated from cow dung cake gave 100% results in off season management of empty bee frames from notorious pest Galleria mellonella (Linn.) in semi air tight and air tight units. The application of cow urine and its plant based formulation also did not have any adverse impact on the growth parameters and foraging behavior of Apis mellifera. The mustard crop treated with desi cow urine @ 20% showed maximum foraging rate of (24 flower/bee/min), while the maximum foraging speed was observed in Holstein cow urine @ 20% as (5 sec/bee/flower). Thus the study conducted in Pantnagar suggested a novel thought of utilization of cow urine and its based formulation to manage the diseases and pest in bee keeping without utilization of toxic chemicals.

Keywords: cow urine, Apis mellifera, foraging, neem, European foulbrood, Galleria mellonella

INNOVATIVE APPROACHES IN APPLIES SCIENCES AND SOCIO-ECONOMIC DEVELOPMENT GOVT. POLICIES AND PLANNING FOR SUSTAINABLE AGRICULTURE AND ALLIED SECTORS
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For global agriculture systems to produce enough food to sustainably feed nine or ten billion people by 2050, there is a need to shift in consumer and producer behavior and a structural change toward more refined technologies, information and knowledge management systems and policies that promote market-led incentives for growth of farmers. Programs and policies should encourage Agri-business development and public-private partnerships, and much importance should be given other than agriculture like bee keeping, fish rearing, apiculture and other allied activities so that farming and agribusinesses can provide more economic development opportunities for rural communities. Integrating agriculture with other sectors such as bee keeping, fish rearing, apiculture and sericulture will bring greater impact. Policy and institutional reforms are necessary to align the incentives of producers and consumers toward greater sustainability. Transparency, monitoring and evaluation, and continuous adaptation to changing contexts are key point for sustainability. Regulation is an important part of good governance, but it should be focused on specific areas such as protecting the farmers from distress sale, ensuring food safety, or protecting vulnerable natural resources like forests, water, and fish stocks and encourage the farmers to involve in integrated farming system.

Keywords: Govt. policies, Sustainability and Agriculture and Allied sector

DEVELOPMENT OF VERSATILE SOLAR POWERED PNEUMATIC SEED CLEANING MACHINE
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Vegetables are important constituents of Indian agriculture due to their short duration, high yield, nutritional richness, economic viability and ability to generate on-farm and off-farm employment. The vegetable production system is linked with quality seed use. Clean seeds have better germination ability and better storability. In general, vegetable seed growers are
small and marginal farmers, thus small capacity cleaning machines are required. Vegetable seeds generally contain lighter impurities which are of the same size as seed. Pneumatic cleaning is most suitable to clean vegetable seeds because of simple construction and have less moving parts. India is having around 300 clear sunny days in a year which can be a better alternative of energy conservation for small and marginal farmers. Thus a solar-powered pneumatic seed cleaning machine was developed for which the engineering properties of selected seeds (bottle gourd, sponge gourd, garden pea, and radish) were determined. Results depicted an increasing trend in size, angle of repose, coefficient of friction and terminal velocity with an increase in moisture content but bulk density and true density showed a decreasing trend with moisture content. Terminal velocity of 10.13 m/s was found to be highest for garden pea seeds and it was selected for designing air velocity of the machine. The optimized results of blower design were 4 numbers of blades with 70° tilt angle for maximum air velocity with minimum power consumption. Performance of machine was evaluated and it was found that the cleaning efficiency of the machine was more than 90% for all seeds. Physical purity was determined experimentally before and after cleaning and it was observed that all seeds have more than 99% physical purity.

Keywords: Nutritional, Vegetable seeds, Terminal velocity, Pneumatic, solar-powered

USE OF ICTS ACTS AS A BOON FOR RURAL WOMEN IN SMALL SCALE FISH FARMING PRACTICE

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Fishery is an important aspect in India providing financial support to a large number of households and hence this reflects on economic growth of the country. As per the Handbook of Fishery statistics, Government of India, this country is the second largest producer of fish contributing 5.68% of global total during 2013-14. Small-scale fish farming practices can be adopted as a useful technique to provide high quality animal protein and other nutrients for nutritionally vulnerable groups especially for Rural women. This farming system offers increasing food production and net farm income and also improves nutritional status, promotes natural resource, providing sustainable use of resources and improving the socio economic status of Rural women. In addition to that ICTs tools play an effective role in small scale fish farming practices to climatic trends, use inputs and resources optimally, and ensure good fish farming practices through improved fish breeds, disease control, market access, and pond management. Success in any fish farming enterprise is largely determined by the amount of information related to fish pond management practices provided and used by Rural women in small scale fish farming practices.

Keywords: Small scale, fish and ICT.
STUDY OF THERMAL PROPERTIES OF WOOD POLYMER COMPOSITE

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Thermal stability of the rubber wood polypropylene composites was studied using a TA Instruments make (Q50) Thermo gravimetricanalyzer (TGA). To study the thermal stability, thermo gravimetric analysis of composites was done. About 10 mg of the composite granule was used for the study. Granules were heated from room temperature to 600°C at a heating rate of 10°C/min in the nitrogen atmosphere. To investigate the effect of fiber loading on thermal stability of wood polymer composite (WPC), composites blended with different fiber loading percentage (10%, 20%, 30%, 40%, 50%). TGA of wood powder and polypropylene (PP) was also taken for comparison. Weight loss data (%) was plotted against temperature. Composite degradation curves corresponding to temperature showed two different slopes; one for the matrix and other for wood. Thermal stability of the WPC was found to be decreasing with increasing wood content. In all TGA curves first decomposition curve appeared due to wood degradation and second for the PP matrix. Cellulose, hemicelluloses and lignin, the primary constituents of wood fiber degraded within the temperature range of 280-350°C, which is evident in TGA curves, whereas, polypropylene is observed to be degraded beyond 380°C.

Key Words: TGA, WPC, thermal studies, polypropylene

ASSESSMENT OF THE PROBLEMS FACED BY THE BENEFICIARIES OF MHWDP AND THEIR PERCEPTIONS TOWARDS DEGRADATION OF NATURAL RESOURCES

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The present study has been carried out in the purposively selected Solan, Sirmour and Mandi districts of the state by selecting randomly a sample of 270 respondents comprising of 180 beneficiaries and 90 non-beneficiaries, in terms of 2:1 ratio for the comparison of both the categories of respondents. The problems related to resource utilization on beneficiary farms within the preview of project interventions have been highlighted on the basis of responses of beneficiaries and ranked using Garrett’s ranking technique. The results shows that the most significant production problem has been found to be stray/wild animal menace (72.38%) followed by lack of knowledge about seed treatment (63.27%). Although, different project interventions have been done in irrigation but lack of irrigation facility has been perceived as production problem by 27.91 per cent of beneficiary farms. The range of production, marketing and financial problems has been found within about 25 to 77 per cent, in case solved within budgetary constraints of the input supplying agencies may lead to enhanced inputs’/resources’ use efficiency on agricultural farms in the study area that can be further lead to overall social welfare therefore enhanced crops’/livestock production levels. In mid hills of Himachal Pradesh, 17.94 per cent of beneficiary farms have been found with the view of decrease in the cultivated land, river, stream and local water bodies; and around 19 per cent of the respondents has perceived decrease in the amount of drinking water. More irrigation has been found to be main mitigation option, i.e., 71.11 per cent, followed by construction of water harvesting structures (70.56%) and change in crop variety (68.33%). Changing climate situations have brought forth new problems and led to mitigation options like shifting to new crops and their varieties, changing sowing planting dates and constructions of water harvesting structures.

Keywords: Watershed, problems, Garrett’s ranking, and natural degradation

ECONOMIC ANALYSIS OF CAULIFLOWER CULTIVATION IN INDIA

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Cauliflower (Brassica oleracea L.) is a very popular vegetable belonging to cole group of vegetable. It grows in almost all the states of India but plenty of cauliflower is produced in the region of, Union Territory of Delhi, West Bengal, Haryana, Tripura, Orissa, Punjab, Minlinep, etc. Cauliflower is grown on many different types of soil, but does best in a rich, well drained soil with a high moisture-holding capacity. High humus content in the soil will provide better aeration and water penetration. If a soil is low in organic matter, stable or green manures can be supplied. Cauliflower is an excellent source of vitamin C, vitamin K, folate, pantothenic acid, and vitamin B6. It is a very good source of choline, dietary fiber, and omega-3 fatty acids. It is also good source of minerals such as manganese, copper, iron, calcium and potassium. As the Indian population is increasing, the demand for fresh vegetables is also increasing. India is the world’s largest producer of many vegetables but still there is a huge gap between per capita demand and supply. Vegetables compared to other food items provide low cost nutrition source. It can be produced even small amount of land and also in homestead area. It can be grown within a short time period and more than one crop can be grown within a crop season. There are a large number of vegetables...
having different varieties, which can be grown throughout the year. Most of the farmers did not follow the recommended doses of input use except human labour, tillage, fertilizer and manure. In addition to that farmers need good quality seed to grow better vegetables. Go and NGO can take care of it. Finally, government should come forward to address the problems and constraints of the vegetables farmers and try to solve those in time.

Keywords: economic analysis, cauliflower, India

PLANT DEFENCE MECHANISM
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Adjustment is probably, one of the most important virtue of a system that ensures it survival, be it host or parasite. On planet earth, the green plants (autotrophs) constitute the only biological system capable of converting solar energy (electro-magnetic radiations) into chemical energy. Plants as a biological system resist this exploitation, at all levels and by all means. The co-evolution, forced by co-existence with pathogens, has led to development of defence mechanism in plants. Thus, resistance against any ‘detrimental act’ has become a natural and universal response of plant system. The resistance against parasites/pathogen is the heritable trait of plants by virtue of which they resist attack by parasites/pathogens or their activities. The defence mechanism(s) has ensured the survival of plants in spite of living amongst some of the potentiality devastating pathogens in addition to abiotic stresses. Plants have also developed ability to resist/tolerate various abiotic stresses. Plants represent a rich source of nutrients for many organisms including bacteria, fungi, protists, insects, and vertebrates. Although lacking an immune system comparable to animals, plants have developed a stunning array of structural, chemical, and protein-based defenses designed to detect invading organisms and stop them before they are able to cause extensive damage. Humans depend almost exclusively on plants for food, and plants provide many important non-food products including wood, dyes, textiles, medicines, cosmetics, soaps, rubber, plastics, inks, and industrial chemicals. Understanding how plants defend themselves from pathogens and herbivores is essential in order to protect our food supply and develop highly disease-resistant plant species.

EMPOWERING FARMERS’ COMMUNITY THROUGH DIGITAL MEDIA IN INDIA
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The paper focused on empowering farmers’ community through digital media to achieve India. The Indian agricultural system is the backbone of hope in present scenario. Traditionally, farmers are mostly depending upon fellow farmers as the preferred source of information in India. As per study 67% Indian population is directly or indirectly dependent on agriculture. Extension is dynamic activities in agriculture sector for transfer of agricultural research and technology among Indian farmers. Also, worked as disseminating information to the farmers enabling them to decide certain steps for their agricultural issues. For empowering farmer Government has initiated some flagship programme i.e. digital India with a vision to transform India into a digitally empowered society. There is an urgent need to do efforts to utilise the already developed agriculture extension infrastructure for urban farmers also through digital media. The use of latest digital media in agriculture extension will be beneficial for both urban and rural farmers of India. Main consideration of national extension system of India is to imparting advice, information and knowledge, and transfer technology to the rural farmers using KVK and ICT. Agriculture extension need to be more emphasised through digital media to easy and cost effective access of information. So that present agriculture extension system will be utilized for farmers in spite of enhancing socio-economic condition of Indian farmer community by providing agriculture extension information services.

TRANSFORMATION OF PEA WASTE (BY PRODUCTS) INTO VALUE ADDED PRODUCTS
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Pea is the second most consumed and important food legume in the world. In the present study, efforts have been directed to possible utilization of the pea shells, not only from the point of preservation and waste management, but as a profitable adjunct to the food processing industry. Therefore in the present investigation an attempt was made to utilize these nutrients rich pea shells by incorporating them products were evaluated organostructurally for sensory characters. The study revealed that the pea shells are a good source of crude protein, crude fiber, dietary fiber, calcium, iron, potassium, magnesium and bioactive compounds. In this connection, fibrous coat of shells separated and shells will be cut into small pieces and kept in hot air oven for drying at 40-50°C and make ground to fine powder. In this research five products are prepared at different levels of supplementation to possible utilization of pea shells powder. In current study the cake were devised by substituting shells powder in place of refined wheat flour at 10% and 20% levels. The sweet biscuits, sweet and salty biscuits were...
devised by substituting pea shells powder in place of refined wheat flour at 5%, 10% and 15% levels. The macroni and noodles were devised by substituting pea shells powder in place of refined wheat flour at 10%, 20% and 30% levels. All the product result of sensory score is 7-8 point using 9 Hedonic Scale. The result indicates that the mean scores are higher in those product which are supplemented with pea shells powder, compare to Control. The products are advantageous for people suffering from lifestyle diseases as these contain high amount of fiber and minerals. Value addition is important in meeting food requirements of growing population by eliminating avoidable losses and making food items more nutritive by processing and fortification of low-grade raw commodities. This study highlights the scope for value addition with pea shells powder. Incorporation of pea shells for value addition in bakery, confectionery and extruded products can be encouraged and popularized in order to improve the intake of protein, dietary fiber and minerals. In this way peels can also be utilized for human consumption otherwise this important source of nutrients goes wasted.

**Keywords:** Organoleptic, Pea shells, Sensory, Substituting, Supplementation, Value addition

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**SYNTHESIS OF NEWER QUINAZOLINONE DERIVATIVES AS POTENTIAL ANTICONVULSANT AGENTS**

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A series of 3-[5-(alkylbenzylideneamino)-1,3,4-thiadiazol-2-yl]methylamino]-2-methyl-6-monosubstitutedquinazolin-4(3H)-one (4a-4l) have been synthesized via condensation of 3-[5-amino-1,3,4-thiadiazol-2-yl]methylamino]-2-methyl-6-monosubstitutedquinazolin-4(3H)-one (3a-3b) with various aromatic aldehydes. Cycloaddition of thioglycolic acid with (4a-4l) yielded 3-[(2-(alklyphenyl)-4-oxo-1,3-thiazolidin-3-yl)-1,3,4-thiadiazol-2-yl]-methylamino]-2-methyl-6-monosubstituted quinazolin-4(3H)-one (5a-5l). The compounds were screened for their anticonvulsant activity and were compared with the standard drugs, phenytoin sodium, lamotrigine and sodium valproate. Out of the 30 compounds the most active compound was 3-[(4-[2(m-methoxy-p-hydroxyphenyl)-4-oxo-1,3-thiazolidin-3-yl]-1,3,4-thiadiazol-2yl]methylamino]-2-methyl-6-bromoquinazolin-4(3H)-one (5l).

**GREEN SYNTHESIS OF ZINC OXIDE NANOPARTICLE AND THEIR ANTIBACTERIAL PROPERTIES**

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The reliable, non-toxic, clean, eco-friendly method is involves in the nanotechnology for the synthesis of nanoparticles so called green synthesis of nanoparticles. In this method wide numbers of bacteria are use for the synthesis of nanoparticles to reduce the uses of toxic chemicals and extreme environment conditions involve in chemical and physical method respectively. The different sizes of nanaparticles (1-100nm) show various bioactivities that are characterize by transmission electron microscopy, UV-UIS spectroscopy etc. Zinc oxide (ZnO) had been recent in research because it has wide range of biomedical application. The antibacterial property of zinc oxide against the diarrhea disease caused by *Escherichia coli* is one of them.

Keywords: Green synthesis, nanoparticles, transmission electron microscopy, UV-VIS spectrocope, antibacterial properties.

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**COST AND RETURN ANALYSIS OF MENTHA OIL PRODUCTION IN SITAPUR DISTRICT OF UTTAR PRADESH**

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Growing mint considered as a bonus cash crops as it does not disturb or replace the cultivation of any major winter and rainy season crop. Being a labour intensive crop, cultivation, distillation, processing and marketing of mint provide ample employment opportunities in rural areas. Sakran and Biswan block of Sitapur District having highest area in mentha cultivation was selected from 19 blocks of sitapur district. A list of 100 farmers were selected randomly from villages namely Sakran, Kutbapur, Kuttupur Nipania, Nipania Maphe based on acreage under menthe cultivation 925 from each village). The farmers were categorized in marginal, small, medium and large category for analysis and interpretation of results. the major component on which cost was incurred being machinery charges 12.58 percent and Manure & fertilizer 18.02 percent. The input output ratios reveals that one rupee invested earn rupee 2.27 to 7.44 for marginal and large farmers respectively. The economic benefit gets reduced over different cost concepts over all the size group of farmers. Benefits over cost C3 the profit got reduced to 41.85, 38.37, 40.08, and 36.15 percent for marginal, small, medium, large farmers respectively.

Keywords: Cost And Return Analysis, Mentha Oil
EFFECTIVENESS AND OPINION OF AGRI-EXTENSION PERSONNEL ABOUT IT AS AN EXTENSION ADVISORY TOOL: A CASE STUDY

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E-extension as a modern method of communication can be used to enhance the effectiveness and efficiency of extension services for agricultural sustainability. E-extension is the delivery of extension services using the internet and the latest information communication technologies (ICTs), which allow networking, online sharing, and collaboration. Agri-Extension personnel are a major factor in conducting an effective agricultural extension work plan; therefore, understanding extension personnel opinion towards the use of E-extension is important. So, the present investigation was conducted in CCS Haryana Agricultural University, Hisar. A total of 108 respondents (23 from main campus and 85 from outstation) were included in the sample of study. Primary data was collected using a self-administered questionnaire and analyzed with the help of SPSS using descriptive statistics (Percentage, mean, rank order, standard deviation etc.). The results of the study revealed that internet has enhanced the practice of extension and personal contact adjudged as a most effective extension tool with a mean score of 4.19.

Keywords: E-extension, Agri-Extension personnel, Opinion, Internet, Effectiveness.

ROLE OF MEDIA IN INDIAN EDUCATION SYSTEM

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Education is the process of learning and knowing, which is not restricted to our school text-books. It is a holistic process and continues through our life. Even the regular happenings and events around us educate us, in one or the other way. It would not be an exaggeration to say that the existence of human beings is fruitless without education. An educated person has the ability to change the world, as he/she is brimming with confidence and assured of making the right moves. It Makes Better Citizens, Ensures A Productive Future, Opens New Vistas, Spreads Awareness, Helps In Decision-Making, Bolsters Confidence. The term media is derived from Medium, which means carrier or mode. Media denotes an item specifically designed to reach a large audience or viewers. The term was first used with the advent of newspapers and magazines. However, with the passage of time, the term broadened by the inventions of radio, TV, cinemas and Internet. In the world of today, media has become almost as necessary as food and clothing. It is true that media is playing an outstanding role in strengthening the society. Its duty is to inform, educate and entertain the people. It helps us to know current situation around the world. The media has a strong social and cultural impact upon society. Because of its inherent ability to reach large number of public, it is widely used to convey message to build public opinion and awareness. The role of media in education is evident today by the number of computer labs, television sets and libraries that have become part of curriculum in most schools today. Media comes in different forms and each form affects the way students learn and interpret information. Media has brought the world closer (globalization) so that now students from different universities in different parts of the world are connected through a mere internet connection. Amidst the information revolution mass media has become such a massive part of our lives.

Keywords: Education, Mass media

STUDY OF THE EFFECT OF DIFFERENT WEATHER VARIABLES ON DIFFERENT STAGES AND FINAL SEED YIELD OF SOYBEAN CROP IN THE AKOLA REGION OF VIDARBHA, INDIA

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Soybean crop is grown predominantly under rainfed conditions in Vidarbha region where weather parameters play an important role at different phenophase of the crop influencing the growth, development and final yield performance. So in order to identify such parameters and quantify their contribution, a field investigation was carried out during kharif season of 2014 at the All India Coordinated Research Project on Agro meteorology under Dry land Agriculture Research Centre, Dr. Panjabrao Deshmukh Krishi Vidyapeeth, Akola. Four sowing times (27 MW-July 07, 28 MW-July 14, 29 MW- July 21 and 30 MW-28 July) to create different set of environmental conditions for weather variability and three varieties (JS-335, JS-9305 and TAM 98-21) were laid out in Factorial Randomized Block Design with four replications and 12
treatments. Correlation coefficients of soybean yield with different weather parameters prevailed during different phenological stages of the crop were worked out. Weather parameters influencing the soybean yield were identified to develop yield prediction equation through regression technique. The correlation and regression study revealed that rainfall during pod formation to full seed development showed highly significant positive impact on soybean seed yield. Higher day time temperature (T max) during pod formation to seed development was found to have negative impact on soybean yield. The data across the total crop growing period showed that rainfall, humidity (RH-I), GDD and PTU showed significant positive association with seed yield of soybean. Thus the results of this study revealed that pod formation to full seed development stage is the most sensitive stage and rainfall and higher day time temperature (T max) are the most significant weather variables for soybean seed yield under rainfed condition in Vidarbha region.

NUTRITIONAL VALUES OF MUSHROOMS
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Mushrooms can be defined as “a macro-fungus with distinctive fruiting bodies. The mushroom fruiting body may be umbrella like or of various other shapes. Mushroom is a saprophytic fungus that grows on dead and decaying organic matter. Due to the absence of chlorophyll, it is unable to synthesize its own food and hence is dependent upon the organic substrate for food. Today, the popularity of mushrooms is due not only to their culinary value but also to their potential as a source of protein that can enrich human diets especially in some developing countries where meat may be rare and expensive. Mushrooms contain more protein than either fruits or vegetables. They can be eaten, as they are cooked or raw, unlike other protein sources such as soya. Mushrooms are also low in cholesterol. Besides their protein content, mushrooms are also high in certain vitamins such as B, C, D, riboflavin, thiamine and 5 nicotinic acid. Mushrooms are also a good source of iron, potassium and phosphorus in addition to folic acid, an ingredient known for enriching the bloodstream and prevention deficiencies. The invention of the so called “wonder drug” penicillin was a landmark in the field of medicinal uses of fungi. Since then several fungi have been well recognized for their antifungal, antibacterial, antiviral, antitumour and many others such properties of pharmacological values. In the recent past a variety of medicinal preparations in form of tablets, capsules and extracts from mushrooms have been produced and marketed.

Keywords: Mushrooms, protein, fungus and nutritional value

DIELECTRIC SPECTROSCOPIC METHOD FOR FOOD QUALITY DETERMINATION
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Food materials have different biological properties which has been a criterion to define its quality. Dielectric properties of agricultural materials are finding interesting applications in industries and laboratories. Dielectric spectroscopy is a method which provides information about the dielectric responses of materials when kept in electromagnetic field. Dielectric spectroscopy is a simple, rapid and non-destructive technique to extract information from the sample. Dielectric constant, dielectric loss factor, loss tangent and alternate current conductivity are electrical responses which are of concern in heating, drying and storage of food materials. Dielectric constant is the ability of a material to store electrical energy; loss factor is related to various absorption mechanisms of energy dissipation; loss tangent is the ratio of dielectric loss factor and dielectric constant. These responses can be measured by sensing several parameters such as frequency of alternating electric field, moisture content, temperature, bulk density, structure and constituents of food materials. These properties are very important in evaluating the penetration depth of energy and characterizing physical properties of biomaterials which helps in grading of food commodity. Moisture content in food material is the key ingredient that affects the dielectric properties. Moisture content and dielectric constant has strong correlation thus gives an idea about change in water activity during storage. Detection of adulteration in food is one of the recent applications because bulk density, viscosity and constituents may change which form a base to detect change in dielectric properties. Dielectric spectroscopy has also been applied for frying oil quality degradation. Thus, detection of change in dielectric behaviour of food is a method of qualitative determination of food material by non-destructively.

Keywords: Dielectric constant, dielectric loss factor, Moisture content, Non-destructive
GOVERNMENT POLICIES AND PLANNING FOR SUSTAINABLE AGRICULTURE AND ALLIED SECTOR

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Agriculture has been a way of life and continues to be an important livelihood of the masses in India. The country is the second largest economy in Asia, as measured in terms of its GDP. The performance of the agricultural sector has been quite impressive, making the country self-reliant in food. But agriculture sector still needs attention from government to form some policies and planning for its sustainable growth. The World Commission on Environment and Development, defined sustainable development as ‘the development that meets the needs of the present without compromising the ability of future generations to meet their own needs’. Appropriate agricultural policy, food procurement and distribution policy are needed for sustainable agricultural development. The formulation and implementation of agricultural policies in India is very complex process, involving a number of ministries, departments and institutions at both the centre and the state levels. The Union Ministry of Agriculture, under the guidance of the Planning Commission, provides the broad guidelines for agricultural policies. The state governments, however, continue to retain the constitutional authority over the sector. After independence, India pursued a policy of food self-sufficiency in staple foods — rice and wheat. The policies were initially focused on the expansion of cultivated area, community development, and restructuring of rural credit institutions. In addition, pricing of inputs such as seeds, chemicals, electricity and irrigation water must be controlled by the government. Farm subsidies should be rationalized and better targeted to benefit the small and marginal farmers. These subsidies are justified as they benefit not only small producers but the society at large. Moreover, there is a need to follow multidimensional model of development especially for small farmers, which requires integration of agri-input, agri-production, agroprocessing and marketing segments of the value chain through public or cooperative sector.

**Keywords:** Agriculture, Sustainable, Policy, Government

EXTENSION AND ADVISORY SERVICES IN INDIA: CURRENT STATUS

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Extension now a days in Indian context, includes all those agencies in the public, private, NGO and community based initiatives that provide a range of agricultural advisory services and facilitate technology application, transfer and management. The situation assessment survey of farmers conducted during the 59th round of the National Sample Survey (NSSO, 2005) provided valuable insights into reach of extension services across India. The data collected from 51,770 households in 6638 villages showed that sixty percent of farmer households did not access any information on modern technology that year. For the farmers who accessed information, progressive farmers and the input dealers were the main source of information. Broadcast media was also used a great deal to obtain information, which included radio, television and newspapers. The public sector extension worker was a source of information for only 5.7 % of farmer households interviewed and the Krishi Vigyan Kendra (KVK) accounted as an extension source for only 0.7% of the sample farmers. Private and NGO extension services were accessed by only 0.6%. The farmer household assessment surveys conducted by the International Food Policy Research Institute (IFPRI) in 5 states during recent years have also shown the importance of input dealers as an important source of information. But the IFPRI studies revealed that a significant number of farmers are also accessing public sector extension, especially the staff of the Department of Agriculture. Other public-sector extension sources put together (that is the KVK, All-India Radio, university extension, and plant protection unit) were used 18% of the time. The remaining 75% of extension comes from the private sector\(^4\). All these reveal the wide diversity in extension provision and the wide variation in the way farmers access various extension sources in different states.

E- NAM: MARKETING INITIATIVE TOWARDS FARMER’S PROSPERITY

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A perfect competitive market is considered to be best in terms of efficiency. Agriculture marketing though has a large number of sellers but the number of buyers is not large in its comparison. Agriculture marketing is a state subject under which the state is divided into markets and each market is controlled by an Agricultural Produce Marketing Committee (APMC) working under its own regulations. This fragmentation of markets, restricts the free movement of agricultural...
commodities and multiple handling at multiple stages results in mounting up of the prices while farmers at the receiving end are still in losses. The electronic national agriculture market - eNAM was introduced in 2016 as a solution to face these challenges. The one nation one market eNAM is a pan India national agriculture market which connects 585 APMCs of the nation in an online portal. A farmer can sell through eNAM at any APMC within the national boundary. eNAM is anticipated to improve market efficiency through competitive and transparent bidding mechanism and minimized manipulations in trading practices due to the inbuilt process. This is due to fact that the role of middlemen has been reduced significantly by selling produce through e-tendering system. The realization of the goals however depends upon the successful implementation and fetching a higher price for the produce.

EMERGING POTENTIAL OF FOOD PROCESSING AND ITS PARADIGM SHIFT IN ITS CONTRIBUTION TOWARDS NATIONAL INCOME.

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Food processing is referred as rainbow industry as it is related to almost all agricultural ventures, changing food habits and dietary patterns also lead to increasing demand of processed food. Various Government interventions like Mega food park scheme, Food processing units and Agricultural and processed food products export development authority (APEDA) assistance for cold chain. Foreign direct investment (FDI) has also been increased to 100% which has attracted various foreign investors in this field leading to robust growth in it. Special economic zones (SEZ) also boosted growth of food processing leading to exemption of excise duty on foreign investors leading to free and fair trade between them. The food industry which is currently valued at US$ 39.71 billion is expected to grow at a compounded annual growth rate (CAGR) of 11 per cent to US$ 65.4 billion by 2018. Food processing industry is one of the largest industries in India and ranks fifth in terms of production, consumption and exports FY 16. Food processing industry contributes 14% to national GDP. Food processing industry can act as game changer in near future as it is still to be explored.

Keywords: AEDA, FDI, Processing, excise duty.

ROLE OF COOPERATIVE SOCIETIES IN AGRICULTURAL AND RURAL DEVELOPMENT

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A cooperative is an autonomous association of peoples united voluntarily to meet their common economic, social and cultural needs aspirations through a jointly- owned and democratically enterprise. Its play important role in India. Cooperatives provide agricultural credits, funds and inputs. Where state and private sectors have not able to do very much. It also helps to overcome the constraints in agricultural development. Cooperative play a dynamic role in economic growth of under developed country like India and it also promotes social welfare. It is an organization where human value are considered more important than thing else. Agricultural cooperative also know as farmers cooperative where pool their resources in certain areas of activity. A broad typology of agricultural cooperatives distinguishes between agricultural services cooperative which provide various services to their individually farming members and agricultural production cooperatives, where production resources (land, machinery) are placed and members farm jointly. Agriculture cooperatives ultimate help to reduce poverty ensure greater food security and eradicate hunger across globe. It provides opportunity to participate in the decision- making process, giving them greater negotiating process. Cooperative society helps to the farmers by providing top quality of seed, fertilizers, insecticide, pesticide etc. There are number of successful cooperatives in India like IFFCO (Indian Farmer Fertilizer Cooperative Ltd.) in the fertilizer sector another like AMUL (Anand Milk Union Limited) in dairy sector and (SHGs) Self Help Groups and many others cooperative society that are directly benefited to the farmers not only increasing crop productivity but also generate overall income and employments in farming community. Cooperative societies are now playing a very significant role in socio-economic development our country especially rural India.

IDENTIFYING THE NOVEL ANTI-MALARIAL COMPOUNDS

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Objective: The main objective of the current investigation is to model experimentally determined anti-malarial activity to identify the chemical features governing the anti-malarial activity. The present study will help overcome the short comings of
current anti-malarial compounds and offer guidance for the design of new compounds with reduced side effects. Hypothesis: Malaria is a public health problem today for 40% of the world’s population. QSAR certainly decreases the number of compounds to be synthesized by facilitating the selection of the most promising candidates. Our study seeks to elucidate similarity based parameters requirement for inhibition of Plasmodium falciparum glutathione reductase inhibitors which has emerged as a potential target for the treatment of malaria. Methods: The molecules of the series were divided randomly into training set and test set with descriptors retrieved by data reduction. In addition to MLR, PLS analysis was also performed to check the predictive ability and robustness of the developed model. Result: The best model was selected on the basis of various statistical parameters such as coefficient of determination $R^2 = 0.81$, predictive power of model $Q^2 = 0.79$. PLS analysis was also performed on the same data set to check the soundness of the MLR model. The resulted predictive power of model $Q^2 = 0.78$ clearly demonstrates the high predictive ability of the developed PLS model. Implication: According to the developed model presented in the current work, similarity based parameters encoding the charge similarity index of the entire compounds vs compound 1 and 7 are opposite in nature due to the presence of strong and weak electronegative character respectively. Thus, on the basis of charge distribution of compounds we can conclude that weak electronegative as in 1 will produce positive effect on biological activity and high electronegative character similar to 7 will have negative effect on biological activity.

ECONOMIC STUDY ON CREDIT UTILIZATION PATTERNS OF MARGINAL FARMS IN JAUNPUR DISTRICT OF UTTAR PRADESH

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Credit is required in every type of businesses and agriculture is no exception to it. However, the need for agriculture credit becomes all the more important when it moves from traditional agriculture to modern agriculture. Until 1935, the major source of funds for the farmers were the professional moneylenders. Due to their unduly high rate of interest, farmers were heavily burdened with debts. At that time, the reserve bank was very active in pursuing cooperative movements through a variety of initiatives. Despite all those efforts, the provision of credit through cooperative and commercial banks were to the extent to the extent about 4 percent of the total outstanding debt as attend of June 1951. The present study would be carried out with the main objectives of studying the procedures of financing institutions to meet the credit requirements of the farmers and availability of credit. The data collected through personal interview by the well structured and pre-tested schedule especially designed for this purpose. The result indicated that the major problems faced by farmers in obtaining credit are the non-availability of loan in time, the procedures of obtaining credit is more expensive, and documents expenses. This study justified because of its appropriate approach to trace out the constraints in credit utilization and credit behavior of the farmers, so as to meet the credit requirements of the borrowers and availability of credit.

TO ASCERTAIN FACTORS CONTRIBUTING TO THE GRAIN LOSS DURING STORAGE IN DIFFERENT METHODS IN TIKAMGARH BLOCK OF TIKAMGARH DISTRICT

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Agriculture is one of the strong holds of the Indian economy and accounted for 12.9 per cent of the country’s gross domestic product (GDP) in 2014-2015, according to the central organizations (CSO) estimates. During storage, quantitative as well as qualitative losses occur due to factors like insects, rodents, and micro-organisms. A large number of insect pests have been reported to be associated with stored grains. The occurrence and numbers of stored grain insect pests are directly related to geographical and climatic conditions. Keeping this fact in view the study’s aim out at evaluation of grain storage method which was carried out in six villages of Tikamgarh block of Tikamgarh district of Madhya Pradesh. Farmers from each village were selected by proportionate random sampling to make sample size of 120. Pre structured interview schedule was used for data collection by using personal interview method. The study revealed that main causes for rat damage were burrows on mud floor (18.33%) followed by oily nature of food grains (15.00%) and external entry through burrows (13.33%). Whereas, 16.67 per cent, insect damage to food grains was caused by excess moisture in grains followed by improper drying (11.67%), improper ventilation (10.00%) and very few damage is due to access aeration (6.67%), lack of cleanliness (5.83%) and ventilation (5.00%). About 8.33 per cent of the respondents did not indicate any specific cause for damage to food grains due to insects. Hence this study highlights the groups in need of help with control.
ERGONOMIC EVALUATION OF MAIZE AND PIGEON PEA PLANTERS
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A study was conducted on the ergonomic evaluation of maize and pigeon pea planters. Anthropometric data of age groups of (20, 25, 30, 35 and 40 years) subjects were measured when operating maize and pigeon pea planters at three different forward speeds of 1, 1.5 and 2 km/hr. Heart rate, oxygen consumption, power consumption and body part discomfort score of age groups were determined during working on planters. Anthropometric data of stature, popletal, knee, elbow, and shoulder height and body mass index were determined for different age groups. Heart rate, power consumption and body part discomfort score were increasing when age increased but for subject of 40 years oxygen consumption decreased at different forward speeds. Minimum of heart rate, power consumption and body part discomfort score of subject 20 years varied from 83-111 beats/min, 60-65 W and 19-21.25 respectively on both planters at different forward speeds. Heart rate, power consumption and body part discomfort score of subject 40 years age groups were found maximum and varied from 106-129 beats/min, 65-67 W and 26.25-31.25 respectively when operating maize and pigeon pea planters at different forward speeds. Oxygen consumption of 40 years old subject varied from 1.15-1.26 lit./min and for 20 year old subject varied from 1.32-2.3 lit./min. Physiological and postural parameters for 20 years old subject was found best on both the planters.

Keywords: Heart rate, Oxygen consumption, Power consumption and Body part discomfort score.

IMPORTANCE OF UNDERUTILIZED FRUITS FOR HUMAN HEALTH BENEFITS
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Fruits are important part of human diet. They are commercially important and nutritionally indispensable food commodity. The Fruit are consumed by man, mainly because of their organoleptic and chemical property. They play a vital role in human nutrition, by supplying the necessary growth factors essential for maintaining normal health. Major fruit crops like Mango, Litchi, Guava etc. are commercially cultivated while the wild edible fruits refer to species that are neither cultivated nor domesticated, but it come from their wild natural habitat and used as one of the sources of food. Underutilized fruits are an urgent necessity, which will definitely enrich the fruit basket. The crops, which are neither grown commercially on large scale nor traded widely, may be termed as underutilized horticultural crops. These crops are cultivated, traded, and consumed locally. Wide range of underutilized fruits are grown in India, but full potential of these fruits are not exploited, which leads to limited scope for marketing of the processed goods outside the region. Wild edible fruits can contribute significantly to the nutrition of rural inhabitants. Although these fruits can be consumed by people throughout the year in fresh and dried forms, reliance on these edible fruits increases during periods of cereal shortages. Wild edible foods include fruits, leaves, flowers and seeds from spontaneous trees and shrubs. Of these, fruits are receiving increase interest on wild edible plant species because of their nutritional value, vitamin and mineral contents. These fruits are rich in phytochemicals, especially phenolic compounds, carotenoids, terpenes, and other terpenoids. Instead of providing the attractive colors of the fruits, phytochemicals also offer protective effects against chronic diseases, such as cardiovascular diseases, diabetes, and cancers. There are many wild edible fruits which are unknown despite their nutritional and medicinal values therefore, to explore the better utilization of medicinal value wild fruits tree species. Exploitation of these crop leads to fulfillment of nutrient to the burgeoning population.

Keyword- Fruits, Food and nutritional value

ROLE PERFORMANCE OF RURAL WOMEN IN ANIMAL HUSBANDRY PRACTICES
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Women play a significant role in dairy farming but their control over livestock and its products is very minimal. The income incurred from dairy animals neither remains in hands of women nor the decision making regarding sale and purchase of the varies items required in a dairy unit. The study was carried out to know the participation of rural women in dairy activities of Deoria district of U.P state. The study was carried out in two blocks i.e. Salempur and Bhatparrani families owning two to three cattle heads were selected for this study. A sample of sixty families was selected randomly from each block, thus the total sample comprised of 120 families. One female member shouldering the responsibilities in dairy management from each
family represented the study sample. The data were collected personally with the help of structured interview schedule. Data collected were statistically analyzed with the help of frequency and percentages. The data revealed that the participation of women was high in activities such as Cleaning of cattle shed, watering, feeding, milking, disposal of cow dung. The farm women participation was least in dairy related record maintenance, getting loans or credits from the banks, taking animals for grazing, fodder collection and harvesting the fodder crops. Thus there is need to educate them about scientific management practices for increasing livestock production.

Keywords: Role Performance, Rural Women, Animal Husbandry.

EXTENT OF KNOWLEDGE LEVEL OF FARMERS ABOUT PRADHAN MANTRI CROP INSURANCE SCHEME

ANURADHA RANJAN KUMARI, M. K. PANDEY, KAMLESH MEENA, AJAY TIWARI AND R N PRASAD

Pradhan Mantri Crop Insurance Scheme was announced by the Government of India on 13th January 2016. It envisages a uniform premium of only 2 per cent to be paid by farmers for Kharif crops and 1.5 per cent for Rabi crops. The premium for annual commercial and horticultural crops is 5 per cent. This scheme allowed the farmers to pay a very low premium to insure their crops. The difference between the premium paid by the farmers and the premium fixed by the insurance companies is subsidized and there is no gap on the maximum subsidy to be paid by the Government. The present study entitled “Extent of Knowledge of Farmers about Pradhan Mantri Crop Insurance Scheme was conducted in the purposely in Deoria District of Uttar Pradesh. Out five tehsils two tehsils i.e. Salempur and Bhatpar Rani were selected for this study. From each tehsil ten villages were selected purposively. From these villages 8 farmers selected on the basis of random sampling technique. Hence total sample size was 180 farmers. The data were collected from each respondent through personal interview method with the help of structured schedule. The study indicated that majority of respondents fell in medium level knowledge group. The study revealed that unit of insurance is area approach was the most important knowledge aspect as expressed by majority of the insured farmers. There was no significant difference between farmers of both selected tehsils regarding knowledge about Pradhan Mantri Crop Insurance Scheme.

Key words- Knowledge, Farmers, Pradhan Mantri Crop Insurance Scheme.

SOCIO-ECONOMIC STATUS IN C.D. BLOCK KALYANPUR IN KANPUR NAGAR (U.P.)

ANURAG SINGH, RAJMANI, A. K. SINGH S.R.YADAV

The study was conducted in purposively selected one development block of Kalyanpur in district Kanpur Nagar. From the above related blocks 4 villages selected for the study selected randomly in the light i.e. specific objectives. Thus, finally 80 respondents were selected for the study. The data were collected through personal interview method collected data were tabulated and analyzed. Maximum 63.75 percent belong to the middle age groups (36 to 60 years) while 26.25 percent respondents belong to the young age group (up to 35 years). 10 percent respondent belongs to the age group of age (above 60 years). The 72.50 percent respondents belong to backward caste, while 15 percent and 12.50 percent respondents belong to scheduled caste groups and upper caste group respectively. Majority 35 percent respondents have of junior high school, 15 percent graduates and above level, 11.25 percent both primary and illiterate, and 8.75 percent respondents were can read and write. The 52.50 percent of respondents belong to medium size land holding category. (2-4 ha) while 35.50 percent farmers are in category of small size of holding groups and 15 percent, farmers are in large land holding category consists above 4 ha. Majority (90%) respondents having “Agriculture” as their main occupation, while 6.25 percent respondents doing business and 3.75 percent respondents were engaged in service. as their subsidiary occupation.

OPPORTUNITIES FOR SOYFOODS IN INDIA

ANURAG NEMA AND HARSH P. SHARMA

A recent fact-finding mission to India, organized by the United States Soybean Export Council (USSEC), showed farmers need to pay more attention to the country’s untapped soybean market as its population is expected to surpass China in the near future. 65-70% of Indian populations are vegetarian and majority of them suffer with protein-energy malnutrition. Animal proteins are very costly and also have the cholesterol risk. Also, 40% of Indian population are below poverty line and cannot afford traditional pulses. In such a situation, soybean is the only alternative to augment dietary protein supply at an
affordable price. Soybean provides a high quality protein with minimum saturated fat. Soy protein and isoflavones together contribute to a number of health benefits such as, cancer prevention, cholesterol reduction, keeping heart healthy, combating osteoporosis and menopause regulation. Being low in glycaemic index soy plays a very important role in maintaining the sugar levels in diabetics. Hence, direct food uses of soybean have good opportunities for better health and happiness of all the segment of Indian population. Protein rich defatted edible soyflour can be used in wheat and chickpea flours for higher protein content and better nutritional quality. Soy based feed can also be used for high quality and cost-effective poultry, aqua and cattle feeding. Soy protein concentrates, isolates and hydrolysates can be used in food formulations for infants, children, adult and aged persons.

**OHMIC HEATING: AN ALTERNATIVE FOOD PROCESSING TECHNOLOGY**

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Ohmic heating, also known as Joule heating, is a novel heat treatment process wherein alternating electric current is passed through the food materials with the primary purpose of heating them. The food material between electrodes has a role of resistance in the circuit. This produces a heating pattern from within the food, which is much faster than conventional outside heating. Heat is generated instantly and volumetrically inside the food materials (Joule effect) due to the ionic motion. The amount of heat generated is directly related to the current induced by the voltage gradient in the field, and the electrical conductivity of the materials being heated. Technology such as ohmic heating has been developed which can replace, at least partially, the traditional heating methods which rely essentially on conductive, convective and radiative heat transfer. In ohmic heating, heat is generated directly inside the food and this has direct implications in terms of both energetic and heating efficiency. It is called novel thermal processing technology meaning that the change in temperature is the main processing factor. Therefore, ohmic heating is regarded as an attractive commercial technique for food processing. The food related applications of ohmic heating include cooking, blanching, starch gelatinization, sterilization and Pasteurization, oil extraction improvement, shelf life enhancement etc.

**THE ECONOMIC ANALYSIS OF AGRICULTURAL ENTERPRISES IN SUSTAINABLE DEVELOPMENT ASPECT**

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The economic analysis of chosen plant production in big agricultural enterprises in sustainable development aspect is the aim of the paper. The results of the research indicated, that it is possible to use environmentally friendly technologies if economic motivation system stimulating their development is created. These technologies can be characterised by low level of direct costs with profitable indexes at the same time. The advantage of using such technologies is profitable index of production with obtaining middle yields which is essential from the point of view of food over-production and obtaining more healthy food. Initial analysis show that the problem concerns India too. First of all, the phenomenon occurs in big, transformed state farms, which are in leasing today. These enterprises are well managed, using high advanced technologies, particularly in plant production. Therefore, the economic analysis of chosen plant production in big agricultural enterprises in sustainable development aspect is the aim of the paper.

**Keyword:** economic analysis, enterprises in sustainable development

**ANIMAL FEEDING PRACTICES AND THEIR COGNITION AMONG LIVESTOCK PRODUCERS UNDER TUTELAGE AT VETERINARY VARSIY IN PUNJAB**

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Animal feeding technologies adoption is the gateway to doubling the farmers’ income and vocational training courses are one of the ways to boost the cognitive domain of livestock producers so as to augment the adoption level. But in order to convert the gained knowledge into practice/adoption it needs to be retained for an extended period of time. The present study evaluated the cognitive domain in the form of awareness, knowledge level and knowledge index (KI) of livestock producers about animal feed technologies before and after training course at Guru Angad Dev Veterinary & Animal Sciences University (GADVASU), Ludhiana (Punjab) at different time intervals. A pre (0 day of training), post (immediately after training) and
A series of 4-(substituted aryl)-1-[2-methyl-6-(substituted anilino quinazolinon-4) - (3H)-onyl]-3-chloro-azetidin-2-ones have been synthesized by addition of substituted anilines to 4-(substituted aryl)-1-[2-methyl-6-bromoquinazolinon-4-(3H)-onyl]-3-chloro-azetidin-2-ones. These compounds were screened for anticonvulsant activity and acute toxicity. Compound 4-(substituted aryl)-1-[2-methyl-6-(substituted anilino quinazolinon-4-(3H)–onyl] -3-chloro-azetidinone showed most potent activity. The structure of all the synthesized compounds were delineated by elemental (C, H, N) and spectra (IR, proton magnetic resonance and mass) analysis.

**Keywords:** Quinazolines, azetidinones, anticonvulsant activity, toxicity studies.

**SYNTHESIS OF NOVEL QUINAZOLIN-4 (3H) - ONYL AZETIDINONES AS POTENTIAL ANTICONVULSANT AGENTS**

**ARCHANA**

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A series of 4-(substituted aryl)-1-[2-methyl-6-(substituted anilino quinazolinon-4)-(3H)-onyl] -3-chloro-azetidin-2-ones have been synthesized by addition of substituted anilines to 4-(substituted aryl)-1-[2-methyl-6-bromoquinazolinon-4-(3H)-onyl]-3-chloro-azetidin-2-ones. These compounds were screened for anticonvulsant activity and acute toxicity. Compound 4-(substituted aryl)-1-[2-methyl-6-(substituted anilino quinazolinon-4-(3H)–onyl] -3-chloro-azetidinone showed most potent activity. The structure of all the synthesized compounds were delineated by elemental (C, H, N) and spectra (IR, proton magnetic resonance and mass) analysis.

**Keywords:** Quinazolinones, azetidinones, anticonvulsant activity, toxicity studies.
NANOTECHNOLOGY: REVOLUTIONIZING PEST MANAGEMENT IN FUTURE
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Nanotechnology is based on the Greek prefix ‘nano’ meaning ‘dwarf’. It’s one billionth part of a metre. Nanoparticles display properties like chemical and physical reactivity, electrical conductance, magnetism etc. differently from the bulk. Nanobiotechnology, nanopesticide, nano-pheromones and inert nanoparticles can play a pivotal role in managing agricultural pests. Site targeted delivery, stability of active ingredient and increased solubility are added benefits reducing excess run off of pesticides. Nanocarriers, nano-emulsions and nano-formulations are also used in their management. Nanoparticle mediated gene transfer also has promising applications in delivering desired DNA into tissues of host plants inducing resistance against pests. Recent studies are conducted by the application of silver nanoparticles (SNP), aluminium oxide (ANP), zinc oxide and titanium oxide in the control of rice weevil and grasserie disease of silkworm (Bombyx mori) caused by Sitophilus oryzae and Baculovirus BmNPV (B. mori Nuclear Polyhedrosis Virus) (Goswami et al., 2010). Nanotechnology helps in increasing the shelf life of pheromones. Nanogel of pheromones are superior to hydrogels and microcapsules as they are insoluble in water, can be used in managing pests like fruitflies in rainy season also. Successful application of nano-alumina against two stored grain pests, S. oryzae and Rhizopertha dominica have been recently done (Stadler et al., 2010) With so many advantages, still there are challenges in commercialisation and market adoption of nanotechnology based products. It also possesses threats like nano-pollution and mass poisoning. We hope that nanotechnology will emerge as a boon to agriculture in near future.

COST & RETURNS OF POTATO CULTIVATION IN AGRA DISTRICT
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The study reports the economics of potato production based upon the primary survey of 44 growers grouped into small (20), medium (14) and large (10) based upon the area of cultivation of potato crop from Agra district during 2011-12. The overall total cost of cultivation of potato came to Rs. 140303.7 per farm, Rs. 78657.98 per hectare. Among all the inputs, per hectare value of seed of potato was 25%, human labour 14% to total cost that varies directly with farm size because of more hired labour employed on larger farms. The total variable cost 78% on overall farms, showed decreasing trends with the farm size. Total fixed cost was 22% per ha to the total cost on overall farms. Overall total cost C3 of potato was Rs. 154334.07 per farm, Rs. 86523.78 per hectare. The gross income received by farms with overall average of Rs. 188370. Analysis of the efficiency of potato production under different categories of farms showed overall cost of production of potato was Rs. 292.3 per quintal. Overall the output/input ratio was 1:2.39, being 1:3.42, 1:2.61 and 1:2.21 on small, medium and large farms respectively. Thus, it can be concluded that with the investment of one rupee in potato cultivation small, Medium and large farmers earned Rs. 3.42, Rs. 2.61 and Rs. 2.21, respectively.

Keywords: Cost, Returns, Potato, Agra, Cultivation, Output/input ratio.

SOCIAL MARKETING: IMPLICATIONS IN EXTENSION
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Social marketing is the explicit use of marketing skills to help translate present social action efforts into more effectively designed and communicated programs that elicit desired audience response. Marketing techniques are the bridging mechanisms between the simple possession of knowledge and the socially useful implementation of what knowledge allows. Social marketing applies marketing knowledge, concepts and techniques to increase social and economic ends. Extension is said to be “one of the world’s most successful change agencies” and a major purpose of the Extension model is to solve individual problems at the local level, delivering solutions in the form of research-based information. Congruently, social marketing intends to benefit the community by using an understanding of the clients’ needs, perceptions, and preferences to encourage positive behavior changes. Thus, a synergy between the social marketing approach and Extension program-planning process has been identified. Both focus on influencing behaviors as the bottom line and both are successful due to the act of tailoring programming to specific audience needs. Bringing about change through planned programs is a primary responsibility among Extension professionals and a complex task in itself and it may therefore be an area of great opportunity to provide support and professional development programs for Extension. Some professional development activities have revealed a successful increase in Extension agents’ confidence and ability to plan programs to change behaviors and
influence audience characteristics. Hence, this paper aims to blend the Conceptual Programming model with the social marketing process as a means of structuring Extension program planning while using social marketing principles.

ECOTOURISM AND ITS ROLE IN SUSTAINABLE DEVELOPMENT
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Ecotourism, as an alternative tourism, involves visiting natural areas in order to learn, to study, or to carry out activities environmentally friendly, that is, a tourism based on the nature experience, which enables the economic and social development of local communities. Ecotourism is a sub-component of the field of sustainable tourism. It focuses primarily on experiencing and learning about nature, its landscape, flora, fauna and their habitats, as well as cultural artifacts from the locality. Carefully planned and operated ecotourism sites, especially if it is village-based and includes local participation, is able to provide direct benefits that might offset pressure from other less sustainable activities that make use of natural and cultural resources. Therefore, ecotourism and its natural assets and raw materials to create, as well as directing people to travel is an attractive force. Ecotourism helps in community development by providing the alternate source of livelihood to local community which is more sustainable. Its aim is to conserve resources, especially biological diversity, and maintain sustainable use of resources, which can bring ecological experience to travelers, conserve the ecological environment and gain economic benefit. However, achieving the aims in ecotourism depends on whether they are environmentally and ecologically sustainable and economically applicable.

Keywords: Ecotourism, development, cultural resources and conservation.

NANOTECHNOLOGY: A BOON FOR REVOLUTIONIZED AGRICULTURE
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In the present scenario, nanotechnology shows promising role in agriculture through providing new tools for enhancing the crop production, food processing and safety efficiency. Nanotechnology provides several advances in research related to agriculture with special reference to agricultural and food wastes conversion to energy as well as prevention of disease and treatment in plants and animals. Materials which possess special characteristics at the nanoscale could offer a tremendous breakthrough for pathogen and contaminant detection. Nanotechnology possesses the ability to revolutionize the agricultural and food industry with new tools for molecular treatment and rapid detection of diseases as well as enhancing the ability of plants to absorb nutrients etc. Agriculture industry is helped by smart treatment delivery system and smart sensors to combat viruses and pathogens associated with crops. Nanostructured catalysts will be available in future which increase the efficiency of pesticides and herbicides. Nanotechnology will be efficient enough to protect the environment indirectly through the use of alternative (renewable) energy supplies, and filters or catalysts to reduce pollution and clean-up existing pollutants. Controlled Environment Agriculture (CEA) is an advanced as well as hydroponically-based form of agricultural methodology which is broadly used in USA, Europe and Japan for crop management. CEA technology also provide an excellent platform for nanotechnology introduction to agriculture. Various nanotechnological devices for CEA that provide “scouting” capabilities could tremendously improve the grower’s ability to determine the best time of crop harvest, crop vitality and security of food issues involving microbial or chemical contamination. Thus, it can be concluded that agriculture nanotechnology has tremendous potential to revolutionize food and agriculture systems. Security of agricultural and food systems, delivery systems for disease treatment, new materials for pathogen detection and protection of the environment are examples of application of nanotechnology to the science and engineering of agriculture and food systems.

FARMER’S KNOWLEDGE LEVEL ABOUT RECOMMENDED BRINJAL PRODUCTION TECHNOLOGY
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The present study was conducted during 2016-17 to assess the knowledge level of farmers about Brinjal production technology. A total of 120 Brinjal growers were selected randomly from 10 villages of Gohad block of Bhind district (M.P.). For data collection, the respondents were interviewed with the help of a structure interview schedule containing questions on Brinjal production technology. Each component has been assigned a particular score to assess knowledge level of Brinjal growing farmers. The collected data were analyzed with suitable statistical methods. The study concludes that more than fifty percent (62.50%) respondents had medium level of knowledge while only 19.17% falls in the category of high level of
knowledge about recommended Brinjal production of technology. This may be due lack of exposure towards agricultural messages from interpersonal and mass media channels.

WOMEN ENTREPRENEURSHIP IN INDIA; PRESENT STATUS, DIRECTIONS AND ACHIEVEMENTS

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The development of women entrepreneurship has become an important aspect of our plan priorities. Several policies and programmes are being implemented for the development of women entrepreneurship in India. There is a need for changing the mindset towards women so as to give equal rights as enshrined in the constitution. In the words of President APJ Abdul Kalam "empowering women is a prerequisite for creating a good nation, when women are empowered, society with stability is assured. Empowerment of women is essential as their thoughts and their value systems lead to the development of a good family, good society and ultimately a good nation." At present, women’s entrepreneurial role is limited in the large industries and technology based businesses. As per the third all-India census of Small Scale Industries, only 10.11% of the micro and small enterprises were owned by women, and only 9.46% of them were managed by women. While the number of women operating their own business is increasing globally, women continue to face huge obstacles that stunt the growth of their businesses, such as lack of capital, strict social constraints, and limited time and skill. Entrepreneurship among women, no doubt improves the wealth of the nation in general and of the family in particular. Women entrepreneurship must be molded properly with entrepreneurial traits and skills to meet the changes in trends, challenges global markets and also be competent enough to sustain and strive for excellence in the entrepreneurial arena. The unexplored talents of young women can be identified, trained and used for a variety of types of industries to increase the productivity in the industrial sector If half of the population i.e. Women is mobilized to bear the responsibilities as an entrepreneurs or contributes in the development of nation as such the growth in terms of money would reflect the prosperity of the country.

Keywords: Women Entrepreneurship, Empowerment, Business, policies and programmes.

IMPACT OF INTEGRATED NUTRIENT MANAGEMENT ON SOIL HEALTH AND CROP IMPROVEMENT

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Integrated nutrient management (INM) is not a new concept. It is an age-old practice when almost all the nutrient needs were met through organic sources to supply secondary and micronutrients besides primary nutrients. This may be achieved through combined use of all possible sources of nutrients and their scientific management for optimum growth, yield and quality of different crops and cropping systems. Integrated nutrient management practice is beneficial for sustaining soil health in terms of build-up of organic carbon, macro and micronutrient and enhancing the crop equivalent yield. Organic manures act as nutrient reservoir and upon decomposition produce organic acids thereby absorbed irons release slowly for the entire crop growth leading to higher plant height. FYM works as soil conditioner in addition to supplying plant nutrients and resulting in improvement in plant height at different stages of plant growth. The organic residues that are added to the soil undergo microbial decomposition and in this process, various organic products of decay like polysaccharides are released which act as strong binding agents in the formation of large and stable aggregates which helps to improve the physical properties of the soil. Addition of farm yard manure along with mineral fertilizers is helpful in maximum improvement of NPK status of soil. The increased uptake of nutrient due to NPKS fertilization and organic manure application is due to added supply of nutrients and proliferous root system developed under balanced nutrient application resulting in better absorption of water and nutrients along with improved physical environment.

FOOD SECURITY IN INDIA: PROBLEMS AND PROSPECTS

ASHOK KUMAR KUSHWAHA AND ANUJ PRATAP SINGH

Food security is access to enough food by all people at all time for an active and healthy life. India is truly developing now and its income, infrastructure, per capita income has also developed. But the major problem faced by India is “the problem food management and it’s distribution”. Agriculture is very important to India, employing 55% of its population and providing 16.5% of its annual GDP. Today, India ranks second worldwide in farm output. ...
of banana. Despite ensuring ample availability of food, existence of food insecurity at the micro-level in the country has remained a formidable challenge for India. In the recently released Global Hunger Index of 2017, India ranked 100 out of 120 countries and this report is quite disturbing because India is one of the largest producers of food in the world. Still India is not in the condition to meet the basic food requirements of people. There are many people in India who strive hard even for the square meals. I don’t say that people in village areas are facing this problem, but also people in major cities face the same problems!! Lack of food supply and the nutritional deficiency causes not only a bad mark for the country’s image in the international level, but also causes adverse effect on country’s developing economic policies and it’s structure. Mismanagement of food products and it’s supply also puts country under many dreadful diseases too! This paper is focused on the several foods security issues prevalent in the Indian scenario. Data are taken from relevant sources to analyse the gravity of the food security issues in India. It also covered the several development programmes taken up by the Indian government to counter various food security issues including several schemes and yojanas. India’s biggest challenge still remains ensuring food and nutritional security to its masses.

Keywords: Food security, Challenges, Global Hunger Index (GHI).

ECONOMICS OF SUGARCANE CULTIVATION IN GHAZIPUR DISTRICT OF UTTAR PRADESH
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One hundred respondents were selected from Mardha, block of District Ghazipur through purposive, cum random sampling. Data were collected through personal interview on structured schedule. Tabular and functional analysis was done for presentation of the result. Selected respondents were distributed as 55, 30, and 15 percent from marginal, small and medium category. Overall land holding size was found 1.180 hectare. Hundred percent cultivated area was irrigated. Sugarcane stood on second place in cropping pattern to paddy and wheat which covered 14.40 percent of gross cropped area. Overall cropping intensity was recorded to 239.90 percent which was indirectly related with holding size. Per farm investment was directly related and per hectare was indirectly related with holding size. Per hectare cost of cultivation on overall farm came to Rs. 93290.98 and net income was Rs.63156.54. Sugarcane cultivation was comparatively more profitable on overall farm having highest input-output relationship is 1:1.67. Sugarcane cultivation on sample farms was found as decreasing returns to scale of nature and most of the input factors considered for functional analysis were having significant association with dependent variable. MVP of all the included factors came to more than unity indicating further scope for their investment in order realizes more income. Problems related with technical knowledge and skill was ranked first and financial problem was reported on second place. Farmers also reported about managerial problem which affects the sugarcane cultivation. Most of the problems can be solved if Government made policy decision.

COMPARISON OF SOIL DATA OF AMANIGANJ BLOCK, FAIZABAD WITH SATELLITE IMAGERY USING GIS
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The soils samples from different villages of Amanigunj block including 40 composite samples (0-15 cm depth) taken randomly and ten soil profiles each from each villages were described in the field for their morphological properties, analyzed for physical and chemical properties in laboratory and classified up to family level in order to assess their land use capability, soil fertility status and the comparison of surveyed data with the IRS LISS-IV satellite imagery. About 87.98 % (225.74 km²) of total area of Amaniganj block soils was found under cultivable land which is indicated by pinkish red colour in the satellite image. Saline to saline alkaline nature of soils of Amaniganj block was found from the analysis part of investigation coincides with the satellite image which indicate the presence of salt affected soils by bluish white colour with distribution of 6.76% (17.35km²) of total area of Amaniganj block, Faizabad. Forest area appears as reddish brown colour in the satellite image. The area of distribution of forest was found as 0.84 % (2.16 km²). A good number of water bodies which includes pond and other water recourses clearly observed which is 2.64 % (6.78 km²) of total area. Main water canal also seen. The built-up is about 1.78 % (4.56 km²) of total area of Amaniganj block, Faizabad was also found.

Keywords: Satellite Imagery, GIS
AGRICULTURAL POLICY IN INDIA

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There are substantial empirical evidences on the positive relationship between agricultural growth and economic development. The transformation of agriculture from its traditional subsistence roots induced by technical change to a modernizing and eventually industrialized agriculture sector is a phenomenon observed across the developing world. During the last five to six decades Indian agriculture has witnessed numerous changes. Innovation coupled with investments in, irrigation infrastructure, expansion of credit, marketing and processing facilities led to a significant increase in the use of modern inputs. The discussion in this chapter is focused on the agricultural sector in India in relation to the production dimensions of major agricultural commodities and their export potentials and agricultural policy in India.

Keywords: Agriculture, agricultural policy, credit and developing.

USE OF BIOFORTIFIED FOOD IN HUMAN WELFARE

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Biofortification, enrichment of micronutrients in staple food by plant breeding, is an alternative which looks promising approach for human welfare along with sustaining the agriculture. Transgenic plant breeding approaches is used for the simultaneous incorporation of genes involved in the enhancement of micronutrient concentration and reduction in the concentration of antinutrients. Laboratory experiments show that biofortification is possible without damaging agronomic productivity. Over the past 15 years, conventional breeding efforts have resulted in the development of varieties of several staple food crops like rice [Oryza sativa L.], wheat [Triticum aestivum L.], maize [Zea mays L.], cassava [Manihot esculenta C.], beans [Phaseolus vulgaris L.], sweet potato [Ipomoea batatas L.] containing high levels of the three micronutrients most limiting in diets: zinc, iron, and vitamin A. Success stories of biofortification include lysine and tryptophan rich quality protein maize (World food prize 2000), Vitamin A rich orange sweet potato (World food prize 2016); generated by crop breeding. Biofortification could prove to be a cost-effective and sustainable strategy for alleviating micronutrient deficiency in rural areas of many developing countries, where a majority of the poor households diets is comprised of staple foods, and where access to food supplements and commercially marketed fortified foods is limited. But due to use of some biotechnological tools the adoption and use in not very much popular so far. Besides these challenges biofortified crops offers good role to address the malnutrition problem in developing countries.

Keywords: Transgenic, Genes, Micronutrient, Malnutrition.

NONLINEAR DYNAMICS AND CARBON NANOTUBES

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In mathematics and science, a nonlinear system is a system in which the change of the output is not proportional to the change of the input. Nonlinear problem are of interest to engineers, biologists, physicists, mathematicians and many other scientists because most systems are inherently nonlinear in nature. As nonlinear dynamical equations are difficult to solve, nonlinear systems are commonly approximated by linear equation (linearization). This works well up to some accuracy and some range for the input values, but some interesting phenomena such as solitons, chaos and singularities are hidden by linearization. It follows that some aspects of the dynamical behaviour of a non linear system can appear to be counterintuitive, unpredictable or even chaotic. Although such chaotic behaviour may resemble random behaviour, it is in fact not random. For example, the weather is seen to be chaotic, where simple changes in one part of the system produce complex effects throughout. This nonlinearity is one of the reasons why accurate long term forecasts are impossible with current technology. Carbon nanotubes were assumed to behave as perfectly straight beams or straight cylindrical shell. However images taken by transmission electron microscopes for carbon nanotubes show that there tiny structures are not usually straight, but rather have certain degree of curvature or waviness along the nanotube length. Since the discovery of carbon nanotubes (CNTs) by Iijima in 1991, CNTs have come under ever increasing scientific and technological scrutiny. Nano structured carbonaceous materials have recently became one of the most active research fields in the domain of materials science and engineering. CNTs have shown great promise for nano-electronics, nano-electromechanical systems, reinforced composite structures and nano-devices because of their excellent and unique physical properties such as high mechanical strength, high elastic modules, remarkable flexibility and chemical sensing, effective field emission.
characteristics, quantum conductance, capability of storing large amount of hydrogen and highly anisotropic polarization. Current research for modern applications include: (i) using carbon nanotubes as a scaffold for diverse microfabrication techniques, (ii) energy dissipation in self-organized nanostructures under influence of an electric field, (iii) using carbon nanotubes for environmental monitoring due to their active surface area and their ability to absorb gases. Due to technological applications of CNTs, intensive investigations have been carried out by researchers to elucidate the growth mechanisms, microstructure and novel functional properties. During my talk, I would like to discuss the aging process in Single Wall Carbon Nanotubes by using Poincare surface of sections, time series, phase portraits and Liapunov exponents techniques.

FORESTS AND SUSTAINABLE LIVELIHOOD DEVELOPMENT

AZEEM RAJA, SHIBA ZAHOOR AND MOHIT HUSAIN

Forest resources play an important role in food security, fodder/livestock security, agricultural support, bio-energy security, housing security, cottage industry, health security, socio-cultural security, income security, and employment security for local people in developing countries. Community forestry program have improved livelihood opportunities while addressing sustainable forest resource management. Human capital improves skills development and training. Natural capital gets improved through development of farmers’ woodlots (FWLs), home gardens and other agricultural land. Household welfare development, widening of the sources of energy for cooking and improvement of infrastructure are to be considered as physical capital. Social capital includes formation of groups and networks; trust and solidarity development; development of social cohesion, inclusion and empowerment; and information and communication improvement. This helps in increasing household annual income, promoted household ability in self-financing forest and agricultural activities, and improved capabilities in formal banking transactions, under financial capital development. In 2005, World Development published a Special Issue on “Livelihoods, Forests and Conservation.” Its editorial introduction concluded with a “Looking into the Future” section that called for more research on “the role of forests in socioeconomic development” and “the degree of dependence on forests by the poor”. Thus, it is imperative to develop forest resources integrated with agricultural and industrial progress to enhance livelihood security, poverty reduction and food security.

Keywords: Forests, Capital, Livelihood and security.

OPINION OF FARMERS TOWARDS PRADHAN MANTRI CROP INSURANCE SCHEME IN UDAIPUR DISTRICT OF RAJASTHAN

BABU LAL DHAYAL, RAJEEV BAIRATHI AND ANIL KUMAR MALIK

Looking to the importance of insurance scheme, the present study entitled “Knowledge and opinion of farmers towards Pradhan Mantri Crop Insurance Scheme in Udaipur district of Rajasthan” was conducted in the purposely selected Salumber and Sarada tehsils of Udaipur district of Rajasthan. Five villages from each selected tehsils were taken on the basis of maximum number of beneficiary farmers. Thus, total ten villages were selected for the study. Out of the prepared list, 10 farmers were selected from each village on the basis of random sampling technique. Thus, total 100 farmers were selected for present investigation. Data were collected through pre structured interview schedule. The study indicated that majority of respondents fell in had favourable opinion about this insurance scheme. The study revealed that most favourably opined that most of the time claim is not paid in case of crop is damaged was the most important opinion aspect as expressed by majority of the insured farmers. There was no significant difference between farmers of both selected tehsils regarding opinion about Pradhan Mantri Crop Insurance Scheme.

Keywords: Pradhan Mantri Crop Insurance Scheme, beneficiary, Opinion.
THE EFFECT OF INCOME AND EMPLOYMENT ON DIVERSIFIED FARMS OF KANPUR DEHAT (U.P.)
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The aims of the study to analyse the trends and patterns of agricultural diversification to commercial crops/commodities become an essential strategy that can increasing income in agriculture minimize risk due to crop failure and above all earn foreign exchange. It can also suggest as a means for rapid rural of small and marginal holdings to help poverty alleviation and a planned diversification increases both individual and social gains.
Keyword: commercial crops, income, diversification and etc.

ZERO BUDGET NATURAL FARMING IN INDIA
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In India, use of modern chemical fertilizers, better management of seeds, along with new and modern techniques for farming boosted the country's food grain production. However, continuous use of modern farming methods including chemical fertilizers, pesticides and herbicides has caused serious environment pollution and global health consciousness. Organic farming has been suggested as one of the alternative and remunerative solutions to this problem but faces some limitations. As a whole, it is an expensive process that involves constant expenditure. The modern scenario of the Indian economy shows a deep agrarian crisis that is making small scale farming an unviable vocation. Privatized seeds, inputs, and markets are inaccessible and expensive for peasants. Indian farmers increasingly find themselves in a vicious cycle of debt, because of the high production costs, high interest rates for credit, the volatile market prices of crops, the rising costs of fossil fuel based inputs, and private seeds. Debt is a problem for farmers of all sizes in India. Under such conditions, 'zero budget' farming promises to end a reliance on loans and drastically cut production costs, ending the debt cycle for desperate farmers. The word 'budget' refers to credit and expenses, thus the phrase 'Zero Budget' means without using any credit, and without spending any money on purchased inputs. 'Natural farming' means farming with Nature and without chemicals. Zero Budget Natural Farming (ZBNF) is a set of farming methods, and also a grassroots peasant movement, which has spread to various states in India. It has attained wide success in southern India, especially the southern Indian state of Karnataka where it first evolved. Zero Budget Natural Farming also aims to create the human and social capital necessary for vibrant and inclusive agricultural production.
Keywords: Zero Budget Natural Farming, organic farming, etc.

GEOGRAPHIC INFORMATION SYSTEMS AS AN INSTRUMENT OF RESOURCE MANAGEMENT FOR THE INTERESTS OF SOIL AND WATER CONSERVATION
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Soil and water conservation are cross-sectional assignments. The respective objectives of the individual interest groups cause conflicts of use and lead to different assessments of the soil's potential. Necessary decisions and the practical implementation of soil and water conservation measures require the use of data. These data, which are both spatial and temporal, characterise past, present and, in the case of predictions, also future environmental conditions. The multitude of relevant data necessitates the use of geographic information systems as an instrument for successful resource management. With the use of problem-oriented case studies, it was possible to show that an improved understanding of the system is necessary for both optimisation of the site-specific resource management within the framework of Precision Farming and for the assessment of local to regional conflicts of use with regard to land usage and soil and water conservation. By changing the method, sufficient respective measures regarding documentation, prevention and risk assessment were able to be introduced and implemented. With the objective of practical implementation of a sustainable resource management, the possibilities of short- to long-term initiation of self-organised systems through the networking of available geographical information as well as the respective interest groups involved in the conflict of use formed the focal point of this investigation. The creation of networks linking agriculture, water extractors and nature conservation promotes necessary synergies and emergences, due to increased communication. Not the conveyance of knowledge alone, but rather new forms of understanding cause the interest groups involved to change their behaviour, thus facilitating efficient resource management for the interests of soil and water conservation.
Keyword- Soil, water conservation, Precision Farming, geographic information etc.
DECISION MAKING PATTERN OF RURAL WOMEN IN FARMING AND ALLIED ENTERPRISES IN REWA BLOCK OF DISTRICT REWA (M.P.)

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WRDM¹ M.G.C.G.V.V. Chitrakoot, Satna (M.P.)

The present study was conducted in Rewa district M.P. Out of these Rewa block was selected randomly. Rewa block five villages namely Kitvariya, Karhiya, Bisar, Bhitwa, Mandhi and Total 120 respondents randomly selected. Highest 43% women were from middle age group followed by 31.67 % respondents middle level of education, 46% belonged to the medium cosmopolitness, 43.33% OBC category, 43 percent low social participation, 43.33% small size of land holding, 45 percent low annual income, 46% medium source of information. 45.00% low risk orientation, 46.67% medium economic motivation, 43.33 percent low decision making in home affairs. It was observed that the women decision making pattern of farming activities was highest in storage (1.13) followed by weed management, land preparation, harvesting and threshing, application of manure and fertilizer, Plant protection measures, application irrigation, Methods of sowing, selection of seed variety and seed treatment and Soil testing and soil treatment. Regarding the allied activities of rural women decision making pattern was highest in Value addition (1.23) followed by Marketing, Seed formation, Vegetable production, Fruit production, dairy and cattle production, nursery decision making process, goat farming, Poultry farming and lowest mean score was fish farming (0.12). Out of 120 respondents, 45.00 per cent exhibited low level of decision making process followed by 30.83 per cent had medium and only 24.16 per cent showed high decision making process of farming and allied enterprises in rural women. It was found that the age, caste, social participation, had non - significant association but hypothesis accepted and Education, Cosmopolitness, size of land holding, Risk orientation, economic motivation, annual income, Decision making in home affairs, Source of information had significant association but hypothesis rejected with the decision making process in farming and allied enterprises.

Keywords: Decision making pattern, women, farming and allied activities.

AWARENESS REGARDING ASPECTS OF SUN PROTECTION AND DEVELOPED SUSTAINABLE UV PROTECTIVE CLOTHING FOR COLLEGE GOING GIRLS

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Increased outdoor activities and habits of humans frequently result in more exposure to ultraviolet radiations which consist of different electromagnetic radiations namely ultraviolet radiation (UVR), visible light and infrared radiation. Small amount of solar radiation are beneficial for people and essential for natural production of vitamin D in body. But UV radiation is a known carcinogen and is also responsible for tanning. Hence the study was aimed at collecting data on awareness of respondents regarding different aspects of sun protection and their prevalent practices for sun protection. Different types of sun protective clothing were designed and assessed for their suitability. The data revealed that most of the respondents were not aware of different aspects of sun protection like range of UV radiations, UPF, characteristics of sun protective measures in relation to UV protection. The study also revealed that very less no. of respondents were aware of the availability of textile related sun protection accessories in markets other than scarf and dupatta. Sustainable UV protective clothing was developed in four different styles (shirt, shrug, mask with cap and scarf based). Selected designs were constructed and suitability of protective clothing was assessed on the basis of structural features, aesthetic features and functional features by wear trial. All the items were highly appreciated by the respondents for the intended use.

Keywords: UV radiation, UPF, Sunburn, Tanning, UV Protective Clothing

INTELLECTUAL PROPERTY RIGHTS (IPRS): IT'S ROLE IN PROTECTION OF AGRICULTURE TECHNOLOGY AND INNOVATION

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The Intellectual Property Rights (IPRs) are legal rights established over ideas, inventions, and creations. IPRs provide certain exclusive rights to the inventors or creators of that property in exchange of disclosure of the work. IPRs provide legal rights that allows right holders to exclude the unauthorized commercial use of their creations/innovation by third persons and commercial benefits from their creative efforts or reputation. There are several types of IPRs which has been classified in two broad categories: First, industrial property covering IPRs such as patent, trademarks, geographical indication and industrial designs and Second, copyright and related rights covering artistic and literary works performance. Various international treaties/agreement also protect biological innovation and agriculture technologies. For example: Budapest treaty 1977;

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International recognition of the deposit of microorganism for the purpose of patent procedure. Patent cooperation treaty (PCT): Patent for an invention simultaneously in each of a large number of countries by filling an international patent application. International convention for the protection of new varieties of plants, 1978 & 1991: for grant and protects breeders rights. Convention on biological diversity, 1992: for conservation of biological diversity and sustainable use of biological resources, International Treaty on Plant Genetic Resources for Food & Agriculture of FAO, 2001: conservation and sustainable use of plant genetic resources for food and agriculture. Other important IPRs related international treaties/agreements: Hague agreement, Lisbon agreement, Madrid agreement (Marks), Paris convention, Convention on International Trade in Endangered Species of wild Fauna & Flora, 1975, Cartagena Protocol and Trademark law treaty etc. The following IPRs laws are most appropriate to protect biological innovation and agriculture technology: Patent are probably the most important IPR today for agriculture goods and services as they provide the strongest protection for patentable plants gene, genetically modified plant (GM plant) and biotechnological process for their production. Patent mainly give the patentee the right to prevent third parties from making, using or selling the patented products or process. Patent is recognition for an invention, which satisfies the criteria of global novelty, non-obviousness, and industrial application. However, in India plants or their parts thereof are not patentable. The Plant breeder’s rights (PBR), also known as Plant Varieties rights (PVR), are rights granted to the breeder of a new variety of plant that give the breeder exclusive control over the propagating material seed, tissue culture and harvested material of new variety for a number of years. Plant breeder’s right is weaker than patent protection in that the right holders can only prevent third parties from commercially exploiting the protect material. Marks and signed in commerce can be applied to both agriculture and industrial products. The trademarks owner can be an individually, business organization, or any legal entity. A trademark may be located on a package, a label, a voucher, or on the product itself. The geographical indication (GI) is a name or sign used on products and which corresponds to a specific geographical location or origin a town, or region and give legal right a certification that the product possesses certain qualities, is made according to traditional methods, or enjoys a certain reputation, due to its geographical origin. Most GI relates to agriculture products or those derived from them, as in the case of wines and spirits. The various products in agriculture get geographical indication like as ‘Basmati’ for rice and ‘Darjeeling’ for tea. Protection of such marks prevents third parties from passing off their products as those originating in the given region. Broadly, any confidential business information which provides an enterprise a competitive edge may be considered a trade secret. Trade secret protection can be used by the agriculture sector to protect, for plant material, agriculture harvesting machine, industry output, technical know-how and confidential information. However at present, there is no trade secret act in India. Today’s, developing countries in IPRs, a play vital role in increase economy and developed infrastructures. Policymakers need to pay close attention to the role that IPRs can play in agriculture developments by providing incentives for both domestic and foreign investments. Each industry should evolve its own IPR policies, management style, strategies, and so on depending on its area of specialty. Agriculture research institute, Agriculture University and industry currently have to evolve IPR strategy for a better focus and approach in the global of competition.

**Keyword:** IPRs, Patent, Trademark, Geographical Indication, Agriculture, Technology, Innovation, Trade Secret, Industrial design, Copyrights etc.

**IMPACT OF NEW TECHNOLOGY ON AGRICULTURE IN INDIA**

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Agriculture is a pivotal sector in almost all the developing countries of the world. Thus, it has got its own importance in development of economic conditions of any country. Similarly, Agriculture is back bone of Indian economy. So, agricultural practices must be improved. Agricultural development has been a challenging question posing a continued threat a view of its complex and multidimensional nature. Popularization of new scientific technology in field of agriculture of rural development in India, several massive extension approach and programme have been launched since early part of 20 century. The modified approach was extended to several parts of the country in the form of intensive cultivation with modern technologies. Availability of information on various production technologies in simplified manure and their uses is vital for their acceptance and adoption. Higher yield of agricultural crop mostly depend on the technological development by various scientists and is being an important factor, which is needful for adoption of technology. So knowledge and technology adoption by farmer needs betterment to understand. The recommendation of scientist improve the practice, generally use by farmer. Based on the study and suggestion, a suitable strategy may be developed of improving agricultural development. This information may be helpful for the policy maker, planner for promotion of crop production. This will enable to the owners of agricultural industries and different industrial producers associated with it to draw their attention to improve their present functioning. Above all, this study will also provide a feed back to the scientist for their future research and to build an adequate theory of technological impact.

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PHYSIOCHEMICAL CHARACTERISTICS OF RIVER KRISHNI WATER IN PRE-MONSOON SEASON

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India is a developing country and facing its worse water crisis in the past few decades. To mitigate these water crises Rejuvenation of River is the need of Hour. Several action plans take place for the rejuvenation of North flowing River like Ganga, Yamuna and also for Hindon but there is a lack of efforts in case of small rivers or tributaries. Tributary Rivers merges into Large River at the end of their journey and puts their polluted water into the large River. No matter how many action plan for cleaning of large river take place, but it can’t be rejuvenated until its tributary facing huge pollution. One such polluted River is Krishni, which is a tributary of Hindon River. Pre-monsoon sampling of Krishni River water was performed as per APHA standard. 20 Samples were collected from different sites of Krishni River. Physiochemical parameter such as pH, Conductivity, Total alkalinity, Total hardness, COD, TDS and Heavy metals have been analysed and the results were compared with BIS-10500. The pH of drinking water in the study area varies from 4.6-6.6. COD of the water samples varies 28.8-576 ppm. Conductivity in the River water sample varies from 230- 1087 µS. The value of TDS varies from 99.7-544. The Values of Alkalinity and Hardness varies from 1000-3000 ppm and 150-480 ppm respectively. Heavy metals like As and Cd concentration varies 0.412-3.98 ppm and 0.037-0.075 respectively. As these results shown the Krishni River is highly polluted due to presence of high amount of TDS, COD, Alkalinity and Heavy metals.

Keywords: Krishni River, COD, TDS, Heavy metals, Polluted

NANOTECHNOLOGY: AN ADVANCED APPROACH IN IMPROVING THE IRON CONTENT OF POTATOES

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Dietary anaemia is one of the major global concern as there is a lack of iron in people’s diet. Globally, about 46% of people suffer from dietary anaemia. It possess a great threat to the society as it reduces the ability to work. Nanotechnology can significantly solve the problem of dietary anaemia. Nanoparticles are the microscopic particles which range in size less than 100nm. Supplement of nanoparticles through modern nanotechnology is one such approach in improvement of dietary nutritional requirement. Potato is one of the world’s most economically important tuber crop. It is a rich source of starch, vitamins, minerals, etc. The availability of iron to tubers through soil is very poor so chelated iron fertilizers are used in some regions but it may hamper the soil health. The use of liquid ferric oxide based on nanoparticles not only help to enhance the availability of iron in tubers but also reduce the leaching losses from the top soil and contamination of surrounding watercourses and untreated water can be avoided. It may also help in controlling soil bacteria which cause soft rot in potatoes. It is a cost effective approach in improving the quality of potatoes. The recycling of nanoparticles can be done by suspending nanoparticles in biodegradable polysaccharide matrices which would facilitate the further use of these particles for future consumption.

Keywords: nanotechnology, nanoparticle, potato, iron

ROLE OF AGRICULTURAL CREDIT IN INDIA

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This study will emphasize a focus on the nature of relationship between agricultural credit and agricultural GDP in India, specifically the role of the agricultural credit in support of agricultural growth, using the data covering the selected study. The study will use a analysis framework to build the pathways through which credit will relate to agricultural GDP depending on a control function approach to tackle the problem of endogeneity. The findings from the analysis will suggest that over this period, all the inputs will be highly responsive to an increase in institutional credit to agriculture. An increase in credit flow in nominal terms will lead to a considerable increase in fertilizers (N, P, K) consumption in physical quantities, increase in the tonnes of pesticides, increase in tractor purchases. Overall, it is quite clear that input use will be sensitive to credit flow, where as GDP of agriculture is not credit seems therefore to be an enabling input, but one whose effectiveness will be undermined by low technical efficiency and productivity. Notwithstanding these aggregate findings detailed micro studies would be necessary to provide insights in to this issue. So, finally the study will analyse farmers credit allocation behaviour and their effects on technical efficiency. Data collected will be via multistage sampling procedure. Study results will reveal that the farm revenue collection with land acreage, quantity of labours, cost of fertilizers and insecticides. Farmers that get updated and use the credit optimally to purchase better inputs are likely to improve their farm efficiency. This efficiency can
be technically improved by better access to education. This condition will make them willing to accept for improvements of their agricultural materials.

CONFRONTATIONS WITH AGRIBUSINESS IN INDIA
C. KISHORE

Agribusiness denotes the collective business activities that are performed from farm to fork. It has come to be seen not just as economically important, but as a critical part of society. Sustainability of agribusiness to ensure consumer and producer’s welfare is the need of the time. One of the major reasons resulting in inefficiencies in agribusiness is due to lack of skilled management. The consumer is more conscious of a number of product attributes rather than considering about low nutritive value, good taste, packaging etc. In addition to these problems, there is almost absence of promotions for Indian brands in international market. The other equally important issue relates to the entry of global agribusiness firms in the Indian market for trade, particularly the retail sector. Various other related issues can be solved by the improve in existing marketing system that reduces cost by saving the losses in the marketing channel thereby creating additional employment opportunities in Agri-marketing system. Other suggestions to be considered are bringing new technologies from foreign partners for mass production, advising government for revision of policies, Improve the functioning of factors of production &marketing. Our scientific analysis should lead to carving out a path out of poverty, food insecurity etc.

TESTICULAR DEVELOPMENTAL PROGRESSION DURING ANNUAL REPRODUCTIVE CYCLE IN CHANNA PUNCTATUS
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The study embodies the testicular development in Channa punctatus under varying habitat conditions. Specimens for the study were collected from two different sources natural and ponds. Indices of testicular development showed the significant variation regarding GSI, HIS, CF and SCF. The values for GSI from the natural resources were found highest(3.57±0.360) in July and lowest (0.1020±0.008) in November,while GSI in specimens under captive conditions were also highest(3.189±0.188) and minimum (0.0454±0.001) during February. The values of HSI in specimens from the natural resources were recorded highest (1.5365±0.14) and lowest (0.2654±0.025) in the month of December and June respectively whereas in the specimens of captive condition highest (1.157±..) value in December and lowest value (0.7399±0.020) in the month of July. Condition Factor in the specimens from natural resources were recorded highest and lowest : 1943±125.28,573.732.2±177.01 in the month of February and November respectively while in case of captive condition values for highest and lowest : 993.88±239.7;753.49±84.4.4 in the month of July and October respectively. Somatic Condition Factor for specimens from natural highest(1488.43±125.62) and lowest (729.75±176.39) values were recorded during February and November whereas in the specimens from captive conditions highest(962.23±232.10) and lowest (573.17±84.38) values were recorded. The result regarding GSI,HIS,CF and SCF showed the significant variation owing to the variation in the habitat conditions and natural and artificial food available to the specimens.

MELIA DUBIA: UTILITY FOR PULP INDUSTRY IN INDIA
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During 2010 - 2014 global pulp and paper demand has grown by 7.6 million tonnes. Except China rest of the world fell from 300.3 to 295.8 million tonnes as growth in Latin, East Europe and other emerging Asia was offset by declines elsewhere. Though India’s per capita consumption is quite low compared to global peers, things are looking up and demand is set to rise from the current 13 million tonnes to an estimated 20 million tonnes by 2020. An India Ratings report estimates India’s per capita paper consumption at 9 kg, against 22 kg in Indonesia, 25 kg in Malaysia and 42 kg in China. The global average stands at 58 kg. This indicates there is a lot of headroom for growth in India. Paper demand in India is constantly increasing due to increasing literacy rate and area need to grow more pulp wood is decreasing due urbanization. One way to meet the increasing pulp demand for more paper production, with the sinking land area is by increasing pulp and pulp wood yield per unit area. In this review we have identified a short rotational Melia dubia pulp wood clone with lower lignin content. The screened pulp yield of Melia dubia of two and three years old was 54.63% & 55.36% whereas screened pulp yield was 53.66 % and 54.85%. Keeping constant bleaching condition of Melia dubia wood pulps can improve the pulp bleachability without affecting pulp strength properties, optical properties, and physical properties and improved bleach filtrate characteristics. Two

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and three year old *Melia dubia* clone can be used as short rotation pulp wood by the pulp and paper industry and this can improve environmental and economic performance of the mill.

**Keywords:** *Melia dubia*, pulp industry, consumption and production.

**GEOGRAPHIC INFORMATION SYSTEM FOR GENERATING NATURAL STREAMS AND SPATIAL PATTERN OF SOIL EROSION: A CASE STUDY IN NAINITAL, INDIA**

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Accelerated soil erosion is major problem in all over the world and it requires prevention as soon as possible. Heavy rainfall areas suffer from very severe soil erosion condition. In this study, watershed boundaries, natural streams and gross soil erosion were estimated using QGIS 2.18.4, ArcGIS 10.2.2 and ENVI 4.7 image processing software with proper ground truth techniques. Revised universal soil loss equation was used to determine soil erosion potential. ENVI 4.7 image processing software has been used for taking out the shape of study area from the LANDSAT 8 satellite imagery, for making land use land cover image and normalizes difference vegetation index images. QGIS 2.18.4 image processing software has been used for delineating sub-basins of study area and for creating natural streams inside the sub-basins. ArcGIS 10.2.2 image processing software has been used for applying mathematical equations to determine six factors of revised universal soil loss equation and to get spatial soil loss pattern of the study area. The range of rainfall erosivity factor, soil erodibility factor, slope length factor, slope steepness factor, crop cover factor and conservation practice factor were found between 0 to 3934 t m ha<sup>-1</sup> cm hr<sup>-1</sup>, 0 to 0.0493586 t ha<sup>-1</sup> yr<sup>-1</sup>R<sup>-1</sup>, 0.972726 to 108858, -0.5 to 16.3, 0.184094 to 1 and 0.0 to 0.2394, respectively. The potential soil loss in the Nainital district was found between 0.0 to 219.65 ton ha<sup>-1</sup> yr<sup>-1</sup>, in which maximum area is under 40 to 80 ton ha<sup>-1</sup> yr<sup>-1</sup> soil loss rate which comes under severe soil erosion potential. It was demonstrated that expansion of agriculture, excess rainfall, urbanization and deforestation are causing severe soil erosion in study area.

**Keywords:** Sub-basin boundaries, Natural streams, Remote sensing, Geographic information system, Annual soil erosion

**PROBLEMS AND PROSPECTS OF TRIBAL YOUTH WITH SPECIAL REFERENCE TO AGRICULTURE AS LIVELIHOOD**

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Tribal youth constitute a numerically dominant, potentially resourceful and also adventurous segment of the population. Unlike urban youth who are mostly educated, organize in many forms and have access to facilities and institutions meant for youth services, tribal youth are mostly illiterate are burdened with the needs of their families, lack of opportunities for organizing them to engage in constructive work and also lack guidance for participation in development activities (Rana and Verma, 2017). Agriculture and allied activities support the livelihoods of nearly 70 percent of India’s rural population. In recent years, land based livelihoods of tribal farmers are increasingly becoming unsustainable. Freak climatic conditions, lack of ownership rights on lands, ignorance and illiteracy, chronic indebtedness and evil mechanism of money lenders made the living of tribals more difficult (Roy Burmon, 1993). Agrarian issues stand at the center of development in tribal areas and tribal agrarian issues cannot be treated in isolation (Sinha, 1968). In order to cope up with the changes in agriculture, the tribal youth need a motivational shift. Large cohort of tribal youth currently entering the labour force at an early age in order to support their family. Agriculture is uniquely positioned to absorb these workers, although farming does not often occur to policy makers as a solution to the challenge of job creation. Tribal areas are still predominantly hilly and secluded, most young people are born into farm families. In order to appeal tribal youth and deliver them good job opportunities, agriculture must break through a number of constraints that impede growth and competitiveness. The problems related to tribal youth are on the rise, and likely to increase in the coming years. Thus, there is a necessity to develop good and qualitative vocational training programmes for the welfare of the tribal youth in India. Youth perception about benefit of choosing agriculture as an option for livelihood is a burning issue as majority of them preferred agriculture as the first vocational choice in several studies.

**Keywords**: Tribal Youth; Livelihood; Training; Agriculture
A REVIEW ON BIODEGRADATION OF MELANOINDS FROM SUGARCANE MOLASSES BASED DISTILLERY EFFLUENT

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Many industries are playing a crucial role in water pollution such as textile industries, dairy industries and distillery etc. Distilleries are the major agro-based industries, which utilize molasses as raw material for the production of rectified spirit. This distillery effluent or spent wash is a major source of aquatic and soil pollution. The spent wash is highly acidic in nature and has a variety of recalcitrant colouring compounds as melanoidins. Dark colour of distillery effluent may be attributed due to the presence of these coloured compounds called melanoidins, phenolics and metal sulphides. Melanoidins are high molecular weight amino–carbonyl compounds which are produced by non-enzymatic browning reactions called as Maillard reactions during the food processing and preservation. Biological decolourisation by using fungi such as Coriolus, Aspergillus, Phanerochaete and certain bacterial sp. as Bacillus Lactobacillus have been successfully achieved and thus can be applied as a bioremediation techniques. In this review, we aim to emphasise on composition of spent wash and melanoidins providing a simple understanding of various methods of degradation. Bioremediation by use of bacteria and fungi is greatly emphasised and work done by various group of researchers has been compiled for better understanding of greener technologies.

Keywords: Spent wash, distillery effluent, melanoidins, BOD, Maillard Reaction, biodegradation

THE ROLE OF ICT ON EMPOWERING WOMEN

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Information and Communication technology is used as an extended synonym for information (IT) but is a more. A specific term that stresses the role of unified communication and the integration of telecommunications. Computers as well as necessary enterprise software, storage, and audio-visual systems, enable users to access, store, transmit, and manipulate information. Information and Communication Technologies (ICTs) are a diverse set of technological tools and resources to create, disseminate, store, bring value addition and manage information. The ICT sector consists of segments as diverse as telecommunications, television and radio broadcasting, computer hardware, software and services and electronic media, for example, the internet and electronic mail. The necessary condition for women empowerment can be different depending on the social and economic milieu. For rural women, participation in the social network, relevance in society, freedom of movement, leadership in rural institutions, control on family formation decisions and assets are a key precondition. Empowering them to participate in economic and social progress, and make an informed decision on front-line issues that affect them. Every second recruit entering the $60 billion Indian IT industry is a woman. Currently, Infosys employs the largest percentage of women at 33.4%, followed by TCS at 30% and Wipro 29%. The major players in the IT industry are now offering an environment that will retain the talented women workforce. Education is an area where both developed and developing countries are applying a combination of traditional and new ICT, adapting, for example, the use of a computer, the Internet, radio and television, in formal and informal learning, distance education and in establishing e-learning centers to support education and training of women and girls. International Institute for Communication and Development (IICDs) agricultural livelihood sector project is aimed at improving the incomes of a small-scale farmer and improving levels of efficiency in the agriculture sector, using ICT. This sector is the largest focus for IICD, with a total of 65 project, programme and policies. The project has 180,000 active user and fewer than 2,500,000 direct and indirect beneficiaries.

EXTENT OF ADOPTION AND ATTITUDE OF THE FARM WOMEN TOWARDS IMPROVED ANIMAL HUSBANDRY PRACTICES

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This current scenario of dairying in India calls for intensive efforts directed towards enhancing the milk production, productivity and the acceptance of recommended dairy farming practices at the household level. Present study was conducted in two district i.e. Junagadh and Gir somnath of Saurashtra region to measure the Extent of adoption and Attitude of the farm women towards improved animal husbandry practices. Data were collected from 120 respondents using structured interview schedule which contains the different areas of improved animal husbandry practices. Majority of the respondents possess medium level of adoption (67.50 per cent) towards animal husbandry practices. Majority of farm women possess moderately favourable attitude (70.00 per cent) towards improved animal husbandry practices.

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EXTENSION STRATEGIES INCLUDING E-INITIATIVES TOWARD FARMER PROSPERITY

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Despite a wide range of reform initiatives in agricultural extension in India in the past decades, the coverage of, access to, and quality of information provided to marginalized and poor farmers is uneven. This paper aims to ascertain why farmers are not accessing information and where information gaps exist, despite the variety of extension approaches in India. Using information provision and access as the basis for analysis, the paper reviews some of the major agricultural extension programs in India by considering their ability to provide information and facilitate information sharing and use in farming communities. The review gives a broad overview of the current extension scene in India while providing a synthesis of recent debates and the observations of various authors as well as working groups in the Ministry of Agriculture and the Planning Commission. The paper examines the challenges and constraints of each agricultural extension approach as it attempts to provide farmers with access to information that is relevant to their farm enterprises. As a result of this analysis, opportunities are identified for increasing extension services’ effectiveness and efficiency in reaching smallholder farmers. Research gaps are also identified. The review concludes that there is an increasing need to work in partnership and to share knowledge and skills in order to provide locally relevant services that meet the information needs of marginal and smallholder farmers in India.

Keywords: India, agricultural extension, knowledge, information, innovation, public-private partnership

NANOTECHNOLOGY: AN EMERGING TECHNOLOGY FOR PLANT DISEASE MANAGEMENT.

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Nanotechnology is nowadays most rapid growing and advancing sciences and it has the potential to revolutionize many sectors of science, technology, medicines, and agriculture. Nanoparticles are produced by both biological and chemical methods. The chemical method is commercially used. Nanoparticles can be efficiently & potentially used for crop protection, like in plant disease and insect pest management. Nanoparticles can work just like as the chemical control methods in controlling pathogen and pest population. As nanoparticles are of ultra small size, they can be used directly to target virus particles, viral pathogen and many other small sized pathogens and pest. Nanoparticles can be used as carriers of active ingredients of pesticides, fungicides etc.. Nanoparticles can be used for disease diagnosis, pathogen detection and residual analysis in a much more easier way than the earlier methods. Nanotechnology has many more applications in all stages of production, packaging, storage, processing and transport of agricultural produces. In future years, Nanotechnology will surely prove itself as an emerging technology for plant disease detection and plant disease management.

A STUDY OF SOCIO PSYCHOLOGICAL FACTORS ASSOCIATED WITH THE CREDIT BEHAVIOUR OF FARMER IN ETAH DISTRICT OF U.P.

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To Study of Socio Psychological factor associated with the availabilities and utilization Pattern of credit of borrowing farmer. There farmer categories wise small farm medium farm and large farm are associated in agri crop loan, agri crop and term loan and both in this way available under crop loan 71.26 percent and agri term loan about 28.74 and crop loan as well as agri term loan about 12.89 percent and utilization of crop loan as well as agri term loan in small farmer in crop loan about 68.51 percent and medium farmers in crop loan about 21.55 percent and large farmer in crop loan about 9.94 percent. Agri term loan utilized under to fertilizer as well as small farmer about 54.55 percent medium farmer about 58.33 percent and large farmer about 55.56 percent in other things utilized loan for more than one things under small farmers about 77.42 percent, medium farmer about 23.08 percent and large farmer about 50.00 percent. farmer showing of utilization crop loan in different purposes. Maximum respondant have utilized loan for both purpose seed and fertilizer in case small farmer and large farmer of farm size. majority of 75.00 percent respondant have avail loan range of Rs. 50000 to Rs. 100000
A STUDY ON RELATIONSHIP BETWEEN SOCIO-ECONOMIC STATUS AND LEVEL OF AWARENESS OF THE FARMERS ABOUT LAND USE PATTERN IN WESTERN U. P.

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The present investigation entitled “Study on Relationship Between Socio-economic Status and Level of Awareness of The farmers of Western U.P.” is done with the objectives; (i) To study the socio-economic profile of the farmers and (ii) To study the relationship/association between socio economic profile and level of awareness of the farmers. The study was conducted in Meerut and Bulandshashar districts of Western Uttar Pradesh. From each district two blocks, from each block four villages and from each village 10 respondents were selected randomly. Thus the total sample size was of 160 respondents. The data were collected by personal interview through structured schedule and analyzed using statistical techniques like percentage, standard deviation and correlation of coefficient. Results regarding socio-economic status revealed that the majority (53.10%) of the respondents were belonged to Upper middle age group ranged between 45 to 60 years, maximum (42.10%) were high school passed, highest number of the farmers (33.10%) were found in the small land holding category (1-2 ha), maximum (43.10%) respondents using private tube well for the irrigation, maximum 32.50% respondents’ annual income was above 2 lakhs, majority of the farmers (75.00%) were having scooter/motorcycle for transportation and most of the respondents (95.60%) getting information through progressive farmer/neighbors. The socio-economic variables viz. education, social participation, material possession and information sources had highly significant and positive correlation with extent of awareness and adoption of land use practices. The variables having non-significant positive relationship were age, housing pattern, land holding annual income and occupation; whereas marital status, type of family and size of family were negatively correlated with general knowledge of land use pattern.

IDENTIFICATION OF INDUSTRIAL HAZARDS USING ALOHA

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Generally Hazard is a potentially damaging phenomenon that may produce harm or other consequences to a person or thing like the loss of life or injury, property damage, social and economic disruption or environmental degradation. Industrial hazards are an increasing source of risk to people and their environment. Now days this is an effect of globalization of production, an increasing of industrialization and a certain level of risk o accidents connected with production, process, transportation and waste management. Arial Location of Hazardous Atmospheres (ALOHA) is a programme designed with collaboration of NOAA (National Oceanic Atmospheric Administration) and EPA (Environmental Protection Agency), USA to respond hazardous condition in case of release of toxic chemicals, fire and explosion. It is able to response for emergency planning in hazardous conditions. ALOHA is user-friendly software to generate scenarios of different hazardous conditions. Its primary purpose is to provide emergency response personnel estimates of the spatial extent of some common hazards associated with chemical spills. ALOHA provides estimates of the spatial extent of some of the hazards associated with the short-term accidental release of volatile and flammable chemicals. There are three types of Industrial hazardous categories: dispersion of toxic gas, fire and explosion which modelled by using ALOHA. With the help of Dispersion model in ALOHA we estimate the concentration and duration of release of flammable or toxic chemical in nearby areas of chemical release. Gaussian model in ALOHA also help to estimate the dispersion of gases that have same buoyancy as air. ALOHA runs heavy gas model to estimate the concentration of release of gases, which are heavier than air. ALOHA uses a graphical interface for data entry and display of results. Finally with the help of ALOHA we can easily identify the hazards scenario for fire, explosion and toxic releases in the Industry and identify the area where there is a possibility of exposure to toxic vapors, a flammable atmosphere, overpressure from a vapor cloud explosion, or thermal radiation from a fire are represented graphically as threat zones.

Key words: Industrial Hazards, ALOHA, Dispersion model, Gaussian model, Heavy gas model.

INNOVATIVE STRATEGIES FOR DOUBLING FARMER'S INCOME

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The year 2022 will mark the completion of 75 years of the country’s independence. The year 2022 now is also in the news for another reason also. It will be the year culmination of the Prime Minister ambitious programme of doubling of farmer income. Within 6-7 years the target has to be achieved. The task is challenging but not impossible. Experts claim that if anything is to be doubled by the year 2022-23, it will require annual growth of 10.4 per cent. It will require innovative
strategies, different location specific diversification models, out of box solutions, reorientation of interventions both in the farm and non-farm sectors to double the income of the farmers by 2022. We have to come out of the traditional maize wheat or paddy wheat cycle and move towards diversification. Diversification besides providing regular income throughout the year it also keeps family labour engaged in various activities of different farm enterprises. Dairy husbandry for example is a boon for small farmers, as a family with three cows or buffaloes can earn an annual income of Rs. 50,000 to 60,000, while conserving our precious native breeds. With stall-fed, high yielding animals, the dung availability will also increase by 3 to 4 times, giving a boost to biogas and agricultural production. Another crucial component in raising productivity is the availability of water to crops. Unfortunately about 60 per cent of the area in the country is rainfed and the irrigation potential in the country is less. The only option left to us is to produce more crop per drop. Besides watershed management, constructing check dams and farm ponds should be taken up extensively. Micro-Irrigation should be encouraged to save water and input costs, increase productivity and improve quality of output. The provision of quality seed and nutrients based on soil health of each field is also very necessary. Farmers in the country still use old traditional and local varieties which result in less production. The average seed replacement ratio in the country is less. It is at 25 per cent. In case of pulses and oilseed crops it is still less. In some pulse crops it is even less than 10 per cent. The country faces a problem of warehousing and proper storage facilities. The country need storage facility for more than 60 million metric tonnes but the storage capacity is only for 30 million tonnes. As a result of this huge amount of food grains get wasted. In the absence of proper storage facilities the food grains have to be kept in the open where they are attacked by insect pests thereby severely deteriorating their quality. Larger investments in warehousing and storage structure at the village/Panchayat level will not only help in solving the problem of rotting of food grains but will also enable us to distribute the food grains them among the needy thereby reducing hunger and ensuring food security for all. Presently there is a very low level of food processing and value addition in the country. The value addition in the country ranges from 5 to 20 per cent. This is very less as compared to developed world where a good percentage of food products are processed and value added. Value addition facilities can be provided by strengthening food grain storage infrastructure, cool chain systems for perishables, post harvest processing and marketing facilities. The government has started the electronic-National Agricultural Market. It will enable the farmers to sell their produce to distant places without being physically present there. Presently about 250 markets in the country are connected with the e-NAM. The government has also now introduced a new crop insurance scheme to mitigate various climatic and men made risks at affordable cost:

STRATEGIES FOR REDUCING EMPLOYMENT VULNERABILITY OF RURAL YOUTH IN THE HILLS OF UTTARAKHAND

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Employment vulnerability among the youth, is one of the major challenge faced by developing countries. Most of the youth work in informal sector, which are typified by low levels of income and productivity, poor working conditions, absence of social protection and limited opportunities for their development. Existing youth policies often do not cater for poor rural youth. The capacities of youth to contribute to rural development and transformation remain largely untapped and their potential unrecognized. International Labour Organization (2014) is taking action to tackle the youth employment crisis through a multi-pronged approach for employment growth and decent job creation. Hence, it is important to design the strategies for employment vulnerabilities among rural youth. The present study was conducted 10 villages of Almora and Pauri Garhwal districts of Uttarakhand state. Data was collected from 210 rural youth (15-24 years) through interview schedule. Vocational education, skills and training, roles and responsibilities of government, role of local leader and local institutions, resources and physical facilities, small scale enterprises, social protection and gender equality were the major strategies which will help to reduce employment vulnerability among rural youth. The study will help to the extension policy makers to frame training programmes for rural youth regarding employment opportunities in hills of Uttarakhand and other areas.

Keywords: Employment, Rural Youth, Strategy, Vulnerability, Uttarakhand

ROLE OF PARAMPARAGAT KRISHI VIKAS YOJANA IN AGRICULTURAL DEVELOPMENT

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The Paramparagat Krishi Vikas Yojana (PKVY), an initiative to promote organic farming in the country, was launched by the NDA government in 2015. PKVY is an elaborated component of Soil Health Management (SHM) of major project National Mission of Sustainable Agriculture (NMSA). Under PKVY Organic farming is promoted through adoption of organic village by cluster approach and PGS certification. Fund allotted under the scheme is in the ratio of 60:40 by the Central and State
Organic Electronics: Importance to Sustainable Development
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The biggest responsibility today is to shape the environment for our future generations: electronics are an indispensable part of life, both in present and in future -- forthcoming generations. The natural and nature inspired materials allow for "green" technologies that seem perfectly suited for achieving the sustainability goals in the electronics field. They embody low energy and have bio-degradability and biocompatibility. "Green" electronics represents not only a novel scientific term but also an emerging area of research aimed at identifying compounds of natural origin and establishing economically efficient routes for the production of synthetic materials that have applicability in environmentally safe (biodegradable) and/or biocompatible devices. Researching into the emerging class of "green" electronics may help not only to expand the original promise of organic electronics that is to deliver low-cost and energy efficient materials and devices but also achieve unimaginable functionalities for electronics, for example benign integration into life and environment. The organic semiconductors are receiving nowadays increasing prominence in the field of OLED (ORGANIC LIGHT EMITTING DIODES) display, the only real presence of organic semiconductors in large scale electronics production worldwide. Nevertheless the low charge mobility and air stability of organic semiconductors remain the two (key) limiting factors in delivering high performance for organic electronic devices comparable to their inorganic counterpart parts based on silicon or gallium arsenide for OPV (ORGANIC PHOTOVOLTAICS) and OFET (ORGANIC FIELD EFFECT TRANSISTORS) applications. This paper reviews recent research advancements, their integration in unconventional organic electronic devices and the factors limiting this field.

Keywords: OLED; OPV; OFET

Subject Matter Knowledge of Anganwadi Workers (ICDS) in Different Areas of Competencies
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* KVK, Jehanabad, BAU, Sabour ** KVK, Vaishali, RPCAU, Pusa, Samastipur

ICDS scheme, devoted to the welfare of women and children started with objective to provide a package of services to women and children at their door step. The grass level unit of ICDS is Anganwadi and a centre is run by Anganwadi Worker (AWW). The AWW is the main functional unit and on her, rests the penultimate responsibility of making the scheme a grand success. The accomplishment of the objectives set forth requires a number of jobs/activities to be carried out by AWW and for that she must possess subject matter knowledge. The study was conducted in Kalyanpur block of Samastipur District in Bihar by randomly selecting 90 Anganwadi Workers (AWWs). The research aimed at assessing the subject matter knowledge possessed by AWWs in six areas of competencies and to know the relationships and relative contributions of their characteristics. The findings revealed that the overall knowledge of AWWs varied between low-medium to high-medium. The level of formal educations of AWWs was positively and highly significantly correlated which also contributed significantly in their subject matter knowledge.

Impact of Nutrition Training on Knowledge of Rural Women
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KVK, Jehanabad, BAU, Sabour KVK, Vaishali, RPCAU, Pusa, Samastipur KVK, Sahebganj, BAU, Ranchi

Malnutrition is still a widespread health problem in India. As the present scenario indicates that millions of children are still victims of protein-energy malnutrition and lack of certain micro-nutrients. Besides children, women are also the neglected segment of the society. So, there is a need to give a serious attention on the efforts to raise the health & nutritional status of entire family. Poverty, low purchasing power, lack of nutrition knowledge, wrong cooking practices followed and prevalence of social taboos are important factors contributing to the malnutrition. Even the available foods are not utilized properly due to the wrong cooking practices followed by women. Researchers have indicated that mother's level of nutritional knowledge contributes significantly in improving the health & nutritional status of entire family. This provides a condition to plan and impart such training in nutrition for women to bring desirable changes in their level of knowledge. This paper examines the
impact of training related to nutrition education imparted by Krishi Vigyan Kendra (KVK), Jehanabad to rural women in terms of knowledge component of behaviour. The study was conducted in five adopted villages of KVK, Jehanabad in Bihar state. The training was imparted to women for seven days on different components of nutritional practices such as balanced diet, infant feeding & weaning, deficiency diseases, conservation of nutrients during cooking, food preservation, food hygiene and food fads & fallacies. Training was given using appropriate teaching methods and aids and by following 'Before and after' experimental design. Random sample of 20 women in each training group from each adopted village was taken. The sample thus consisted of 100 women in experimental group and 25 respondents served as control group. The findings indicated that there were considerable variations in mean knowledge scores of respondents with respect to different nutritional areas. The data showed that the respondents had very low knowledge in all five areas of nutrition at pre training phase. But after the training, there was considerable gain in knowledge level of women. The findings of the study revealed that the nutrition training had a definite positive impact in increasing level of knowledge about nutritional practices. This led to conclude that, there is a strong need to educate and to impart training to rural women about different components of nutrition and nutritional practices in order to improve health and nutritional status especially of the vulnerable groups of the society.

A COMPREHENSIVE STUDY ON IMPACT OF FACILITY BASED NUTRITIONAL CARE ON MALNOURISHED FEMALE CHILDREN

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Home Science, Monad University, Hapur

Malnutrition is a condition that results from eating a diet in which one or more nutrients are either not enough or are too much such that the diet causes the problem. In rural India, not getting enough nutrients is the main cause of malnutrition. The gender based ratio of malnourished children is higher in female child. This condition leads a malnourished female child to malnourished adult girl who again give birth to a malnourished child; and the cycle repeat itself again and again. The Indian government plan to make India malnutrition free. So government made the “Nutrition Rehabilitation Centre” scheme all over the affected states. The facility based study done at “Nutrition Rehabilitation centre, Etah (UP)” over malnourished female children (0-5yr) to access the impact of nutritional care on the beneficiaries health. In the study, the beneficiaries stayed in facility for 10-15days under observation of skilled team of doctor, dietician, and staff nurses. In this period of time beneficiaries goes under 10 steps of nutritional management; after getting discharge, beneficiaries goes through short term and long term follow-up process to continuous assessment. This study will show, how nutrition leave its impact on a life. “How a well-nourished mother deliver a well-nourished child who made a healthy society which leads a healthy INDIA.”

KUPOSHAN BHARAT CHHORO: A STUDY ON THE PREGNANT WOMEN AND IMPACT OF ANEMIA ON THEIR HEALTH

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Anemia in pregnancy is a frequent manifestation and an important health problem in the developing countries. A hospital-based, cross-sectional study will be conducted among 400 pregnant women, to assess the impact of anemia. The study will be carried out at the Dev Nandini Hospital, Hapur. Anemia is classified as per the WHO grading criteria. A WHO expert Group proposed that anemia or deficiency should be considered when hemoglobin is below 11g/dl for pregnant women. This study will demonstrate the impact of anemia among the pregnant women. These findings are useful for our maternal health program planners and implementers to target and evaluate the interventions.

Keywords: WHO – World Health Origination. g/dl – Gram per Decimal liter.

INFORMATION AND COMMUNICATION TECHNOLOGY (ICT) USE IN AGRICULTURE

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Agriculture is the backbone of India’s economy. Research in agriculture in our country is growing fast but because of many odds and speed-breakers, the speed of Agricultural communication is very slow. Information and Communication Technology (ICT) has been one of the most ambitious field in agriculture sector. 21st century is the era of technology, in agriculture the information and communication technology is a new approach for development of agriculture through dissemination of new technology and agriculture information, timely and in appropriate format to the each and every farmer of country. Mobile phone is a tool of ICT with high potential of dissemination of information and aims to provide current rates of crops to farmers choose suitable time and market to sell their crops for maximum profit. Information and Communication Technology (ICT) can improve farm management and farming technologies by efficient farm management.
Information and Communication Technology (ICT) helps in better marketing exposure and pricing and reduction of agricultural risks and enhanced incomes. The crop forecasting, input management, command area management, watershed management, land and water resources development, drinking water potential mapping precision management, natural disaster management, fishery management hill area develop and post harvest management are the key areas, where Information Technology can play its imperative impact. Information plays an important role in the field of agricultural development by informing the farmers about new techniques in agriculture.

FEATURE SELECTION USING MATRIX CORRELATIONS AND ITS APPLICATIONS IN AGRICULTURE

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Dimensionality reduction techniques are broadly categorized as feature extraction and feature selection. Feature extraction techniques select features in the transformed space while feature selection techniques consist of finding a subset of original features or variables that is optimal for a given criterion for adequate representation of the whole data. Principal Component Analysis (PCA) is often the most common choice for reducing dimensionality of multivariate data through feature extraction. However, dimensionality reduction using PCA does not provide a real reduction of dimensionality in terms of the original variables, since all of the original variables are used in projection to the lower dimensional. Several criteria have been proposed for selecting the best subset of features which can preserve the structure and variation of the original data. However, little is known about the applications feature selection techniques in agricultural and biological research where many measurements are taken on each individual. In the present study, applicability of matrix correlation based feature selection techniques has been examined for identification of informative and redundant features in wheat data. RV-coefficient (Robert and Escoffier, 1976) and Yanai’s Generalized Coefficient of Determination (Ramsay et al., 1984) have been used to measure the similarity between two data matrices. Subsets selected using different criteria have been compared in terms of the measure of overall predictive efficiency. For identification of important features, secondary data of 67 wheat genotypes recorded for 14 characters have been used. Models built with subset of best features are expected not only to reduce the model complexity but also require less time and resources.

Keywords: feature selection, feature extraction, dimensionality, PCA, matrix correlation, agriculture

PROBLEMS ENCOUNTERED BY THE RESPONDENTS IN ADOPTION OF AGRO-FORESTRY

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The study was conducted in Kaithal and Yamuna Nagar districts of Haryana state during the year 2013-14 randomly selected. A total number of 120 respondents performing agro-forestry constituted the sample of the study. The information about respondents’ socio-personnel traits, problems and prospects regarding Agro-forestry adoption were collected with the help of structured interview schedule. The study conducted on problems encountered by the respondents in adoption of Agro-forestry revealed that there were more than half of respondents were facing medium level of problems such as financial, technical, production and input management. Study revealed that problems related financial aspects in adoption of agro-forestry ‘Marketing risks for Agro-forestry produce’ was found to be highest as it first ranked followed by the statement ‘Lack of respondent’s knowledge about credit sources. And the results pertaining to the technical problems encountered by the respondents in adoption of Agro-forestry are ‘Marketing risks for Agro-forestry produce’ got Ist rank followed by ‘Lack of respondent’s knowledge about credit sources. Lack of interest among respondents due to long duration of return’ was ranked first with highest mean score of production problems. Main input management problems of Agro-forestry were ‘Lack of quality seedling for AFS’ followed by ‘Lack of knowledge about proper finishing of wood for market respectively.

Keywords: Constraints and Agro-forestry

NUTRACEUTICAL AND THERAPEUTIC PROPERTIES OF AEGLE MARMELOS (L.): AN OVERVIEW

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Aegle Marmelos (L.) Correa (A. marmelos), is a medicinal plant of Rutaceae family having a long history of curative property in traditional medicine. This plant is a rich source of bioactive compounds and natural antioxidants which can be isolated from its various parts such as fruit (carotenoids, tannins, flavonoids, ascorbic acid, marmelosin, marmelide, psoralen, aurapten, luvangetin); leaf (phenols, lupeol, skimmianine, citral, aegeline, eugenol, citronella, marmesine) and bark.

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(marmin, skimmianine, fagarine) etc. Many clinical and pre-clinical researches suggest the neutraceutical and therapeutic applications of *A. marmelos* such as anti-bacterial, anti-fungal, anti-viral, anti-ulcer, anti-diabetic, anticancer, anti-inflammatory and antioxidant properties which plays a potential role in the prevention and treatment of various diseases. This review article focuses on exploring novel bioactive compounds of the *A. marmelos* plant possessing potential therapeutic and health promoting applications.

**Keywords:** *Aegle marmelos*, Bioactive compounds, Nutritional properties, Therapeutic potential.

**ECONOMICS ANALYSIS OF GARLIC**

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Garlic (*Allium sativum L.*) is one of the most important and widely consumed bulbous spice crops both in India and world. Garlic crop of commercial importance in India is valued for its flavor and has been used for thousand years as spice or condiment throughout the country. The bulb can be consumed as a spice or condiment in the form of different processed products such as garlic paste and pickles. Garlic cultivation in India is under horticulture, which is an important sector of Indian agriculture. Horticulture occupies 8.50 per cent area of the cultivable land and contributes about 28.00 per cent of gross agricultural output during 2010-11. As per FAO estimates the world area under garlic (2008-09) is 12.04 lakh ha and production is 156.86 lakh tones. The main garlic growing countries in the world are China, India, Spain, Russia, USA, Argentina, Myanmar, Ukraine and Pakistan. China ranks first in area and production (6.92 lakh ha and 120.8 lakh tones). In productivity, Egypt tops the list (22.4 t/ha) followed by USA (18.39 t/ha), China (17.45 t/ha), Korea (11.81 t/ha), Spain (8.97 t/ha) and India (4.07 t/ha) (FAO, 2011). India is the second largest producer of garlic in the world. India on an average produces 10.59 lakh tones from an area of 2.00 lakh hectares (2010-11). Garlic is grown commercially only in few states in India. The major garlic producing states in the country during 2010-11 are Madhya Pradesh (25.80% of country’s area and 18.30% of its production), Gujarat (19.11% of area and 21.74% of production), Uttar Pradesh (16.74% of area and 15.06% of production) and Rajasthan (11.94% of area and 11.86% of production). The net income from garlic crop not only depends on the level of production but also on its efficient marketing. The analysis of cost of production and inputs is important to cut costs and increase profit.

**Keywords:** *Allium sativum L, Net income, cultivation*

**VALUE ADDITION OF UNDERUTILIZED FRUITS: CASE OF INCREASING FARMER’S INCOME**

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Minor, traditional, neglected, orphan, promising, underdeveloped fruits are not so extensively cultivated, and their consumption and trade remain to be more limited. In India, there are almost 150 of consumable species of such underutilized fruits and accounts for about 27% of fruit production. These neglected fruits are enriched with nutritional and medicinal value and can be grown even in arid regions without much care. These fruits were an important source of food for mankind before dawn of civilization and domestication of present day fruits. Cavemen in forests also depended on these fruits and passed on valuable information on utility and choice of wild species of fruits from generation to generation. The scattered nature of production and processing of underutilized fruits has been a constraint to the emergence of an organized marketing network for the produce. However they are freely available to the consumer and comparatively very cheap in price to use as raw material. Nutrient rich, innovative products can be possible from these economically cheaper fruits which are seasonal and naturally available. For any enterprise, good marketing of their products at better prices is very much essential. Digital marketing offers small businesses an affordable and efficient mode of advertising. This is the web era and as we may have noticed that there have been a rising number of populations browsing internet on a daily basis. Therefore, internet marketing automatically becomes a great tool to market the business on web. So, there is a good potential for more innovative products to produce and empower through small scale entrepreneurship.

**Key words:** Underutilized fruits, value added products, digital marketing, income generation

**UTILISATION OF BACKYARD FARM POND THROUGH PISCICULTURE FOR ENHANCING NUTRITIONAL FOOD SECURITY OF RURAL WOMEN**

**GANESH KEJRIWAL1 AND BISWA RANJAN SAMANTRAY2**

40  Venue : Sardar Patel Auditorium, Swami Vivekanand Subharti University, Meerut (U.P.) India 20-22 October, 2018
Pisciculture has prospered rapidly since the 1970s, and was the fastest growing food production industry in many countries for the past two decades, overtaking terrestrial farm animal meat production and landings from capture fisheries. It supplied around 40% of fish products globally and in Asia is the most important aquaculture region in the world, which currently contributes 92% of the world aquaculture production. Fish is a low-fat high quality protein. Fish is filled with omega-3 fatty acids and vitamins such as D and B2 (riboflavin). Fish is rich in calcium and phosphorus and a great source of minerals, such as iron, zinc, iodine, magnesium, and potassium. It is recommended that eating fish at least two times per week as part of a healthy diet. Fish is packed with protein, vitamins, and nutrients that can lower blood pressure and help reduce the risk of a heart attack or stroke. In Rural areas deficiency of nutrition is a major concern especially for rural women. Utilising backyard pond for pisciculture has unique features in effectively addressing the need of improving nutritional food security and the livelihood of rural population in highland and remote areas of India. In order to maximize its contribution with limited resources, it is highly suggested that development efforts on the part of various organizations should be in line with the priority goals of the national development plans.

Keywords: Pisciculture, fish and nutritional food security.

RELEVANCE OF INFORMATION AND COMMUNICATION TECHNOLOGY IN EDUCATION
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Education is considered as one of the most important sectors for economic and human capacity development. ICTs are important tools that enables and support the move from traditional ‘teacher-centric’ teaching styles to more ‘learner-centric’ methods. Information and Communication Technology defines the role of telecommunications i.e. wireless signals and telephone lines, computers as well as necessary enterprise software, hardware, storage, and audio-visual systems, which enable the users to store, transmit, access and manipulate information. Education has undergone extreme transformations due to advancement in recent technology and also made transformations in agriculture sciences. Tools such as word processors, databases, spreadsheets, and presentation software when integrated into student-centered classroom can promote the development of contemporary skills such as communication, and analytical thinking. Information and Communication Technology (ICT) plays an important role in supporting powerful, efficient management and administration in education sector. It is specified that in education sector technology can be used right from student administration to various resource administration. ICTs help students in browsing contents through e-books, sample of previous examinations and articles. When appropriate use of ICTs are done, it helps in expanding access to education, strengthen the relevance of education to the increasingly digital workplace, raise educational quality and helps in making teaching and learning into an engaging, active process connected to real life. The rapid growth of information and communication technologies (ICTs) offers a good opportunity to educational institutions worldwide to enhance the learning process at all levels of education which will help in producing positive outcomes.

PRADHAN MANTRI JAN DHAN YOJNA (PMJDY) – A NEW WAY FOR MAINSTREAMING THE FINANCIALLY EXCLUDE
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Most recently a national mission on financial inclusion called “PRADHAN MANTRI JAN - DHAN YOJANA” was launched on the 28th of August 2014. Under the direct supervision of the Indian Prime Minister and the Department of Financial Services, Ministry of Finance, the objective of this mission is to enrol over 70 million households and open their bank accounts along with providing them as a first step a RuPay debit card with a Rs. 1,00,000/- accident cover. In the due course of time the plan is to also cover these account holders with insurance and pension products. About 60% of the population in India does not have access to a bank account. The urban population of financially excluded category mainly
comprises of low income groups like urban labourers, slum dwellers of the cities and socially excluded communities. Poverty as a result of absence of income or irregular income, low education, lack of financial education, and location of financial service providers beyond close proximity make it difficult for the service providers to provide financial services which in turn becomes a primary reasons of financial exclusion. It is also believed that financial exclusion also leads to social inclusion.

Keywords: Financial Literacy, Poverty, Urban Poor

FARMERS’ PERCEPTIONS ON PRODUCTION AND MARKETING OF MEDICINAL AND AROMATIC PLANTS IN KULLU DISTRICT OF HIMACHAL PRADESH-INDIA

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Medicinal and Aromatic Plants played a significant role in the subsistence economy of the people of Himachal Pradesh, especially those living in the rugged and impoverished hills, mountains and rural interiors. The collection, simple processing and trading of medicinal plants contribute significantly to the cash income of the poor and women in this region. There is a growing demand for M&APs at the global level. The export of M&APs brings nominal money to the farmers at the local level. Fair benefit from the trade has not been initiated yet. The challenging problem prospecting is not only to make a comprehensive inventory of M&APs, but also to address the social, economic and environmental issues in an integrated approach. A proper study of the market and up-to-date market information can make the trade a highly profitable option while increasing the livelihood options and diversifying the portfolio of products. For this research, sample size of 60 farmers of Kullu District of Himachal Pradesh was taken. A structured questionnaire was prepared for the present study. Findings revealed that the level of awareness on production and marketing of medicinal and aromatic plants among the farmers was moderate. Even for the moderate usage, respondents were enjoying some benefits like better income and better market information. This highlights the scope of production and marketing of medicinal and aromatic plants highly useful in the coming future.

Keywords: Medicinal and Aromatic, Production and marketing,

ECONOMIC ANALYSIS OF AGRICULTURAL PRODUCTION AND MARKETING OF MUNSYARI REGION

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Johari Shoka traders of Munsaryi used to have strong trading relationships with Tibet. From ancient time agricultural, animal rearing, trading with Tibet and wool industry is the base of economic life of Johari Shoka community. They always excelled in Tibet trading. Johari Shoka used to fulfill their daily needs through Tibet trading. Johari Shoka and Tibetan traders had very old relationship. Both community imported and exported trading goods. Tibetan traders exported wool, borax, all kinds of woolen goods, animals (sheep, goat, mule, dogs, horses) etc to Shoka Johari traders and Shoka Johari traders used to export cereals (rice, pulses, wheat, millets), potato, tobacco, sugar, salt, spices, cloths etc. Shoka traders could only exchange salt and borax for cereals. Tibetan traders had to pay cash for rest of the goods. No credit transaction was allowed to Tibetan traders. The main trading markets of Shoka traders were Munshiyari, Ramnagar, Madkot, Tanakpur, Bageshwar etc. They used to travel impossible routes to reach out to markets which were very unsafe. Trades between Johari Shoka and Tibet traders got extinct due to closing of Tibet trading in 1962. This led to social and economic decline among Johari communities.

EVALUATION OF PRODUCTION POTENTIAL OF PEARL MILLET (Pennisetum glaucum L.) ACCESSIONS AS AFFECTED BY DIFFERENT CUTTING MANAGEMENTS AND IRRIGATION WATER QUALITY

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42 Venue : Sardar Patel Auditorium, Swami Vivekanand Subharti University, Meerut (U.P.) India 20-22 October, 2018
A pot experiment was carried out in 2015-16 under transparent shed facility of ICAR-CSSRI, Karnal Haryana. The experiment was conducted in Factorial RBD with three Replications to assess the fodder production potential of 20 Pearl millet accessions derived from ICRISAT with three cutting management (as single, dual and multicut purpose) under two qualities of irrigation water \([0.69 \text{ (I}_1\text{-Fresh water/Best available water/tap water)}\) and 6.0 dS m\(^{-1}\) \((\text{I}_2\text{-Saline water)}\)] scheduled at 1.2 ID/CPE ratio. Total green fodder yield was affected significantly due to main effect of irrigation water quality, cutting managements and accessions and their interactions. Use of saline water (319.0 g/pot) for irrigation had significantly reduced the green fodder yield as compared to tap water irrigation (377.0 g/pot). Significantly lower green fodder yield was found in \(C_1\) (319.8 g/pot) in comparison to \(C_2\) (347.1 g/pot) and \(C_3\) (377.0 g/pot). The maximum green fodder yield was observed in ICFH-15 (357.5 g/pot) followed by ICFH-16 and ICFH-17; minimum in ICFH-04 (341.9 g/pot). The highest value for growth attributes were also noticed in ICFH-15. From our study we conclude that ICFH-15 and ICFH-16 accessions of pearl millet may be adapted under either \(C_3\) and \(C_2\) cutting management strategy for green fodder purpose as a choice for getting higher yield as compare to other accessions under saline environment of north-western region in India and elsewhere under similar agro-climatic conditions.

Keywords: Pearl millet accessions, cutting management, salinity and Fodder

ROLE OF WOMEN IN SERICULTURE
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Sericulture is essentially a village-based industry that provides employment to both skilled and unskilled labour, women and aged persons at homes at minimum risk. India continues to be the second largest producer of silk in the world and has 16.58% share in global raw silk production. Among the four varieties of silk produced as in 2016-17 the production increased up to 30265 MT. The employment generation in the country is raised to 8.51 million persons in 2016-17 compared to 7.65 million persons in 2012-13. The present article will mainly explore the role of women in sericulture and includes the concept of work, division of labour, segregation of occupations, and dimension of labour and household activities. This article will further discuss the preparation of women toward silkworm, feeding and so on. Women are mostly favoured because of their industrious nature. They are employed in a mulberry garden or silkworm rearing or in a grainage. Coming to the post cocoon technology, the involvement of the women is greater, commencing from silk reeling, weaving and garment manufacturing industry. However, their work has not always been properly recognized or suitably rewarded. Thus the analysis clearly establishes the importance of sericulture over other crops in the generation of fresh employment opportunities in rural areas.

KEY WORDS-Women, Sericulture, employment, tribal, income.

PERFORMANCE OF MAIZE SHELLER IN DIFFERENT VILLAGES OF EAST KAMENG DISTRICT, ARUNACHAL PRADESH
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Experiment on performance of maize sheller compare to traditional method was conducted during 2013-2014 and 2014-2015 in ten villages of East Kameng District, Arunachal Pradesh. All total 40 farmwomen were selected, four from each village. The trial showed that the use of maize shellerthe efficiency has increased as large size maize takes 21-23 second to shell per cob, medium size maize takes 18-20 second per cob and small size maize takes 15 – 16 second per cob whereas in traditional method, where farmers use their fingers to shell the maize, it takes 1min.15s to 1min.25s per cob for large maize, 1min. to 1min. 5s per cob for medium maize and 30s to 1min. per cob for small maize. The maize sheller has very good ease of shelling in compare to traditional method as farm women had complain about the cuts and swelling of fingers while shelling maize, but after use of maize sheller, zero cuts and swelling of fingers. Thus, it can be conclude that maize sheller has very good efficiency, ease of shelling and is drudgery reduction equipment.

Keywords: Maize sheller, Efficiency, Ease of shelling.

STRATEGIES FOR CONSERVATION OF DOMESTIC ANIMAL DIVERSITY IN INDIA
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The genetic resources of farm animals in India are represented by a broad spectrum of native breeds of cattle, buffaloes, goat, sheep, swine, equines, camels and poultry. The genetic biodiversity among this livestock needs to be conserved. Conservation is effective management of genetic resources for human use and it is always better to keep the live populations of animals or in situ conservation, which may go on improving not only in production potentials but also in their adaptation to the changing environment. In situ conservation of Beetal goat and Kilakarsal sheep breeds has been successfully undertaken in their native tract, which resulted in addition of animals to their dwindling population. In another approach of conservation, different forms of germplasm has been cryopreserved, which offers great advantage for conserving large livestock biodiversity. Frozen Semen is ideal for genetic resources utilization activities and NBAGR stores semen doses of 44 indigenous livestock breeds belonging to 7 species in its repository. Cauda epididymal sperms banking has been started for conservation of caprine and ovine genetic resources. The somatic cells are being conserved for species like camel, where conventional semen freezing and artificial insemination is not well characterized. Considering the large breeds of livestock to be conserved, many agencies are planned to be involved for participation in this venture and exchange of germplasm among them.

Keywords: Livestock, Biodiversity, and Conservation

DEMONETIZATION AND ITS IMPACT ON INDIAN ECONOMY
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The present government took an enormous step to terminate Rs 500 and Rs 1000 notes with prompt effect on November 8, 2016. Proceed was aimed to control the fake currency circulation, black money and terror financing movements in the country. India has the highest level of currency in circulation at nearly 13% of GDP. The act of demonetization is expected to have a marked impact on various sectors. The sectors which are based on cash transactions will witness more disturbances. Therefore an attempt has been made to analyze the impact of demonetization on various prominent sectors of Indian economy that are automobile, pharmaceutical, agriculture and consumer market sector etc. also compare performance of the sectors for pre and post period of demonetization. Demonetization of INR 500 and INR 1,000 notes in India on November 8, 2016 is different from many other countries’ scrapping of high value notes in two respects – the withdrawal of their legal tender status and continuation with INR 1,000 and INR 2,000 notes. It has resulted in a cash shortage. Non-cash medium of payments may be encouraged by this shortage, but, with supplies only from the domestic currency presses, the shortage is unlikely to disappear by the end of 2016. Import of currency printed abroad may provide a solution for ending it sooner. The impact of the shortage, if it continues, will be fully felt in the last quarter of 2016-17. Its growth impact in 2016-17 is 0.7-1.3 percent depending on how much shortage continues and for how long. The big painful jolt of demonetization creates the right psychological milieu for the war against black money to start.

Keywords: Demonetization, currency circulation, Cash shortage.

NANOTECHNOLOGY AS A TOOL FOR MANAGING INSECT PEST IN AGRICULTURE
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Nanotechnology is a promising field of interdisciplinary research. It opens up a wide array of opportunities in various fields like insecticides, pharmaceuticals, electronics and agriculture. The potential uses and benefits of nanotechnology are enormous. These include management of insect pests through the formulations of nanomaterials-based insecticides. Traditional strategies like integrated pest management used in agriculture are insufficient, and application of chemical pesticides have adverse effects on animals and human beings apart from the decline in soil fertility. Therefore, nanotechnology would provide green and efficient alternatives for the management of insect pests in agriculture without harming the nature. A number of formulation types have been recommended including nanoeumulsions, nanocapsules and products containing immaculate engineered nanoparticles, like metals, metal oxides, and nanoclays. The atom by atom arrangement allows the manipulation of nanoparticles thus influencing their size, shape and orientation for reaction with the targeted tissues It is now known that many insects possess ferromagnetic materials in the head, thorax and abdomen, which act as geomagnetic sensors. It includes either development of more effective and non-persistent pesticides and new ways of application, which includes controlled release formulation (CRF). There is a great concern regarding the nonmaterial which have potential to exert hazardous effects on human and the environment and when we have a nano-pesticide, it becomes a double edged weapon. Nanomaterials need to be evaluated, so that this novel technology does not meet the same apprehensions and bottle-neck as faced by genetically modified crops (Gopal et al. 2012).

Keywords: Nanotechnology, controlled release formulation, genetically modified crops.
ECONOMIC ANALYSIS OF INPUTS USE PATTERN IN WHEAT CROP IN SEMI-IRRIGATED ZONE OF HARYANA

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This study pertained to the semi-irrigated zone of Haryana state. The study is based on the data collected under the comprehensive scheme to study the cost of cultivation of wheat crop. Under this scheme from each of the 30 centers the data from ten farmers representing 5 size holdings that were up to 1 ha, 1 to 2 ha, 2 to 4 ha, 4 to 6 ha and above 6 ha were collected by the Agriculture Inspectors in different zones. The inputs included in this study are seed, irrigation, fertilizer, insecticide, pesticide and herbicide. Each size of holding represents a sample of 60 farmers. This study is related to agricultural year 2013-14. Data related to actual use of inputs in the wheat crop on each size of holding and in semi-irrigated zone has been tabulated and presented in absolute as well as percentage form in simple and cross tables. The quantity and value of different inputs used per ha in all five size of holding in dry zone are presented. The state average for all the inputs used also calculated. The actual input use has been compared with the recommended dose to find out gap. To estimate the response of the input in the wheat crops grown on the farms, the Cobb-Douglas production function is used. The marginal value productivities of all the inputs (at their mean levels) are estimated by taking partial derivative of the production of the concerned crop and multiplying with the price of its output.

NON-TRADITIONAL PRODUCTS FROM KOKUM: INLAND AND GLOBAL OPPORTUNITIES FOR DOUBLING FARMERS INCOME

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The Genus Garcinia is one of the tropical underutilized medicinal fruit crops. It contains around 200 species, out of which 35 species are available in India and are rich source of nutrients, minerals, vitamins, and dietary fibers. They are also abundant with bioactive compounds namely xanthones, benzophenones, hydroxycitric acid and anthocyanins. Many studies have detailed that these compounds possess antioxidant, anti-inflammatory, anticancer, antimicrobial, anti-allergy, anti-ulcer, antiparasitic, and antihelmintic activities to aid in human health and also weight loss. Therefore, bioactive compounds extracted from Garcinia fruits could be used in the preparation of pharmaceuticals and nutraceuticals. Garcinia indica as biochemically one of the most creative plant species. Appropriate utilization of the non-traditional products like HCA, Garcinol, wine, purified pigments and processes such as organogelation would create more domestic and International demand. This review presents an overview of the bioactive compounds derived from Garcinia fruits and their biological activities for promoting human health as food and drug as well as enhances the farming income.

Keywords: Garcinia, Garcinol, Hydroxycitric acid, Nutraceuticals.

EFFECT OF SALICYLIC ACID ON PLANTS UNDER ABIOTIC STRESS

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Salicylic acid occurs naturally as a derivative of group of phenolic compounds distributed in many monocot and dicot species, including many cereal crops. The regulatory role of salicylic acid is well seen in the various stages of plant life, like seed germination, growth and development, flowering, fruiting etc. Salicylic acid application also affects the uptake and transportation of ions, photosynthetic rate, stomatal conductance and transpiration. Certain stresses like biotic and abiotic, impose primary and further, secondary levels of stress to the plants by the generation of reactive oxygen species (ROS). The role of the SA in defense mechanisms under both biotic and abiotic stresses suggests that it alleviates the salt stress in plants and also multiplies the ROS generation under stress. It’s exogenous application alters the antioxidant enzyme activities and imparts tolerance to plants towards abiotic stress. Treatment with SA increased the fresh and dry weight of wheat seedling and also increased the level of catalase and peroxidase activity in leaf and root samples. SA treatment decreased the H2O2 content. The pre-soaking treatment of seeds with SA positively affects the osmotic potential, shoot and root dry mass, K+/Na+ ratio and contents of photosynthetic pigments in wheat seedlings, under both saline and non-saline conditions. Exogenously sourced SA was reported to improve salt tolerance in wheat due to an enhanced transcript level of antioxidant genes viz. GPX1, GPX2, DHAR, GR, GST1, GST2, MDHAR, and GS, and an increased activity of ascorbate (AsA)-GSH

Venue : Sardar Patel Auditorium, Swami Vivekanand Subharti University, Meerut (U.P.) India 20-22 October, 2018
DEVELOPMENT OF HANDICRAFT PRODUCTS THROUGH HAND EMBROIDERY: AN INNOVATIVE APPROACH

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Handicraft, more precisely expresses by an artisans and it is a type of work where useful and decorative items are made completely by hand or by using only simple tools. The success of handicrafts depends on how well the artisans can produce the articles in keeping with the tastes and preferences of consumers. Hand embroidery is one of the oldest methods of surface enrichment and provides base to creative ideas and challenges in the development of handicraft products. Indian fashion designers recently focused on fusion of traditional art and craft of India to produce novel designs effects along with maintaining the essence of traditional designs on handicrafts and fashionable trendy products. The original Kumauni folk art i.e. aipan designs were collected and adapted according to their suitability for hand embroidery technique. Total ten handicraft products namely photo frame, jewellery box, book mark, document file, pen holder, hand bag, mobile pouch, belt, wallet and wrist band were selected. A total of fifty line design patterns (five for each product) were prepared and out of fifty, total of ten line design patterns (one for each product) were selected for the preparation of design arrangements. The selected design arrangements were applied on handicraft products using hand embroidery technique. Further, these prepared products were visually assessed on four parameters i.e. aesthetic, innovation in design and production, quality and craftsmanship and performance parameters. All the products were widely accepted by the consumers and most of the respondents stated that they would definitely purchase these products if available commercially in the market.

Keywords: Handicraft, Aipan, Product development, Hand embroidery

NUTRIENT EXPERT SYSTEM: PROS AND CONS

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Nutrient Expert System (NE) is a fertilizer recommendation decision support system being developed by International Plant Nutrition Institute (IPNI) is an easy to use, interactive computer-based decision tool that can rapidly provide nutrient recommendation for rice, wheat and maize for individual farmers’ field in presence or absence of soil testing data. The core of the fertilizer recommendation method in Nutrient Expert is based on: Yield response, Agronomic efficiency. The method used the site-specific nutrient management (SSNM) principles, which included the use of the Quantitative Evaluation of the Fertility of Tropical Soils (QUEFTS) model to determine crop nutrient uptake requirements (Xu, et al., 2014). The QUEFTS model was transformed and validated to estimate the optimum nutrient requirement at a target yield. This nutrient expert is a unique tool for large scale implementation of SSNM in India where farmer’s are not access to soil testing lab. This tool estimates the attainable yield based on the growing condition, nutrient balance in the cropping system, residue management and fertilizer/ manure applied in the previous season. This system has the capability to provide location specific nutrient recommendation on the basis of farmer’s resource availability. The NE method utilizes soil indigenous nutrient supply in an attempt to avoid excessive nutrient accumulation in the soil. Easy to use Can utilize locally available nutrient recourses Can provide nutrient recommendation in an individual farmer’s field. Can be useful in presence or absence of soil testing data. Increase profit through optimal fertilizer use. Sustain soil fertility through balanced application of nutrients (fertilizers). Reduce pest and disease incidence through balanced nutrient use. Protect soil, water and environment from contaminations by avoiding excess fertilizer use. Can be a source of mitigation of GHG emission from agricultural fields Requires computer based decision support system. Requires skillful knowledge to operate. Have not yet developed for all the crops. Nutrient Expert for Hybrid Maize was proved to be an effective, promising and sustainable fertilizer recommendation method, and considered to be an alternative method that can be used without soil testing, which is quite feasible for small-holders that could not afford soil testing or soil testing is not timely or available. Although NE is currently developed to be used for those who have access to a computer as a starting point, future work should be considered to reach more users. Xinpeng Xu, Ping Hea, Mirasol F. Pampolinoc, Adrian M. Johnston, Shaojun Qiu, Shicheng Zhaoa, Limin Chuana, Wei Zhoua, (2014).

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IMPACT OF GREEN CHEMISTRY ON ENVIRONMENT

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Green chemistry reduces pollution at its source by minimizing or eliminating the hazards of chemical reagents, solvents, products and feedstocks. This is unlike cleaning up pollution which involves treating waste streams or cleanup of environmental spills and other releases. Majority of research in green chemistry aim to reduce the energy consumption required for the production of desired product whether it may be any drug, dyes and other chemical compounds. It aim to reduce or even eliminates the production of any harmful bi-products and maximizing the desired product without compromising with the environment. The most simple and direct way to apply green chemistry in pharmaceuticals is to utilize non-hazardous, reproducible and efficient solvents and catalysts in synthesis of drug molecules, drug intermediates and in researches involving synthetic chemistry.

SUSTAINABLE LIVELIHOOD SECURITY INDEX: A TOOL FOR ESTIMATION OF SUSTAINABILITY IN AGRICULTURE

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Agriculture is the main activity in developing countries like India, where the majority of rural poor depend on it for income and livelihood. Therefore, sustainability of agriculture cannot be defined in isolation to the issue of livelihoods. Livelihood security means secured proprietorship of, or access to, resources and income-earning activities, including reserves and assets to counteract risks. Sustainable Livelihood Security is the livelihood options that are ecologically secure, economically efficient and socially equitable. It signifies the protection or assurance of the means of livelihood for the masses not only at present but also in future. Sustainable Livelihood Security Index can help to identify whether necessary conditions for sustainable development exist in a given region/ ecosystem or not. SLSI is a composite of indices representing individual indicators under three components, viz. Ecological Security Index (ESI), Economic Efficiency Index (EEI) and Social Equity Index (SEI), which is used to evaluate the sustainability status at farm level and the value of the index varies between 0 and 1. A value close to zero shows low level of sustainability and value close to 1 will denote high level of sustainability. The Sustainable Livelihood Security Index not only identifies the general primacy for development but also the nature and types of policies to be pursued in each study unit to enhance livelihood security. The SLSI aids consensus among different expert group like economists, environmentalists, and egalitarians by balancing their relative concerns which could offer guidelines for ensuring sustainable development. It acts as an educational and a policy tool for promoting integration among planners, administrators, and development workers.

PRADHAN MANTRI UJJWALA YOJANA

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Pradhan Mantri Ujjwala Yojana (PMUY) aims to safeguard the health of women and children by providing them with a clean cooking fuel Liquefied Petroleum Gas (LPG), so that they don’t have to compromise their health in smoky kitchens or wander in unsafe areas collecting firewood. Pradhan Mantri Ujjwala Yojana was launched by Hon’ble Prime Minister Shri Narendra Modi on May 1st, 2016 in Ballia, Uttar Pradesh. Under this scheme, 5 Crore LPG connections will be provided to Below Poverty Line (BPL) families with a support of Rs. 1600 per connection in the next 3 years. Ensuring women’s empowerment, especially in rural India, the connections will be issued in the name of women of the households. Rs. 8000 crore has been allocated towards the implementation of the scheme. Identification of the BPL families will be done through Socio Economic caste census data. PMUY is likely to result in an additional employment of around 1 Lakh and provide business opportunity of at least Rs. 10,000 crore over the next 3 Years to the Indian Industry. Launch of this scheme will also provide a great boost to the ‘Make in India’ campaign as all the manufacturers of cylinders, gas stoves, regulators and gas hose are domestic. This scheme is being implemented by the Ministry of Petroleum and Natural Gas. The budget that has been allotted by the government is Rs. 2000 crore for the financial year 2016 to 2017. These LPG connections will be provided to over 1.5 crore families living below poverty line. The government has provided an additional allocation of Rs 4,800 crore the Pradhan Mantri Ujjwala Yojana (PMUY) and the enhanced the target was to release 3 crore connections by
the end of Financial Year 2017-18, but as a result of efficient scheme implementation and monitoring, more than 3.35 crore connections have been released.

SWACHH BHARAT ABHIYAN

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Swachh Bharat Abhiyan is a national cleanliness campaign established by the Government of India. This campaign is covering 4041 statutory towns in order to clean roads, streets, and infrastructure of the India. It is a mass movement has run to create a Clean India by 2019. It is a step ahead to the Mahatma Gandhi’s dream of Swachh Bharat for healthy and prosperous life. This mission was launched on 2nd of October 2014 (145th birth anniversary of Bapu) by targeting its completeness in 2019 on 150th birth anniversary of Mahatma Gandhi. The mission has been implemented to cover all the rural and urban areas of the India under the Ministry of Urban Development and the Ministry of Drinking Water and Sanitation accordingly the first cleanliness drive of this mission was started by the Indian Prime Minister, Narendra Modi to its launch. This mission has targeted to solve the sanitation problems as well as better waste management all over the India by creating sanitation facilities to all. Swachh Bharat mission is very necessary to run continuously in India until it gets its goal. It is very essential for the people in India to really get the feeling of physical, mental, social and intellectual well-being. It is to make living status advance in India in real means which can be started by bringing all over cleanliness. The tagline of this mission is “Ek Kadam Swachhta Ki Ore.” The Swachh Bharat Mission of Gramin areas aims to the construction of 11 crore household toilets in villages. The ministry had already announced 1,34,000 crore rupees for construction of individual household toilets. Swachh Bharat Mission of Gramin areas target achieved about 853.70 lakhs individual household toilets constructed, 4.60 lakhs villages, 459 districts and 21 states/UTs were free from open defecation till September 2018. Swachh Bharat Mission of urban areas aims to cover 1.04 crore household in order to provide them 2.6 lakhs of public toilets, 2.5 lakhs of community toilets in every town. Where the Swachh Bharat Mission Urban areas target achieved about 44.39 lakhs individual household toilets, 4.09 lakhs community and public toilets constructed and 2767 cities were free from open defecation till September 2018.

ANALYSIS OF PRICES AND ARRIVALS OF APPLE FRUIT IN NARWAL MARKET OF JAMMU

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The present study was conducted with an intention to study the behavior of prices and arrivals of apple fruit in Narwal market of Jammu and also to estimate their trend. This study is based on the secondary data of one decade collected from Directorate of Horticulture, Planning and Marketing, Narwal, Jammu. Ten years monthly data i.e. from 2007-08 to 2016-17 on prices and arrivals of apple have been utilized for modeling purpose. For analytical framework Linear Regression Equation were used to study the Trend of the time Series Data on prices and arrivals and seasonal indices were calculated to study the periodic movements in business activity which occur regularly every year and have their origin in the nature of the year itself. The results showed positive trend in both prices and arrivals of apple. Moreover the prices and arrivals are anticipated to increase at the rate of ₹ 220.06 per annum per quintal which is 15969.42 quintals of apple arrivals per year. The main season for arrivals of local as well as non-local apple from other regions and states in Narwal market was from August to January. Prices for apples were found lowest in the month of April (₹ 6707.00/qntls.) and contrary in the month of August with highest price rate (₹ 100892.50/qntls.). The seasonal indices of arrivals of apple in Narwal market were recorded maximum during the month of October (471.00) and minimum in the month of April (0.19). The seasonal index for prices being lowest in the month of April (0.19) and the highest in August (160.66).

Key words: Trend, Prices, Arrivals, Time series, Seasonal variation, Jammu.

E-LEARNING EDUCATIONAL SYSTEM FOR DEVELOPMENT

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Education is constantly changing the way students learn and how instructors teach. Technology is often the driving force behind many of the world’s changes and innovations. In education, creating an e-learning culture is more about developing
and tweaking what already exists, sharing a common vision, and doing things a little differently. E-learning presents numerous research opportunities for faculty, along with continuing challenges for documenting scholarship. Innovations in e-learning technologies point toward a revolution in education, allowing learning to be individualized (adaptive learning), enhancing learners’ interactions with others (collaborative learning), and transforming the role of the teacher. E-learning refers to the use of Internet technologies to deliver a broad array of solutions that enhance knowledge and performance. E-learning is also called Web-based learning, online learning, distributed learning, computer-assisted instruction, or Internet-based learning. Historically, there have been two common e-learning modes: distance learning and computer assisted instruction. Distance learning uses information technologies to deliver instruction to learners who are at remote locations from a central site. Computer assisted instruction (also called computer-based learning and computer based training) uses computers to aid in the delivery of stand-alone multimedia packages for learning and teaching. Early e-learning systems, based on Computer-Based Learning/Training often attempted to replicate autocratic teaching styles whereby the role of the e-learning system was assumed to be for transferring knowledge, as opposed to systems developed later based on Computer Supported Collaborative Learning (CSCL), which encouraged the shared development of knowledge.

AGRICULTURAL MARKETING, ENTREPRENEURSHIP DEVELOPMENT, IMPORT-EXPORT AGRICOMMODITIES
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The framework under which agricultural produce markets function and factors which influence the prices received by the farmers now need to be understood in a different perspective compared to that in the past. The agricultural marketing system plays a dual role in economic development in countries whose resources are primarily agricultural. To achieve higher growth and move the sector in long term sustainable growth trajectory, market reforms in agriculture need to be undertaken. Entrepreneurship development programs are developed for both aspiring as well as existing entrepreneurs. This is because these programs are also designed to help the entrepreneur expand their existing enterprise. These programs are more effective on the existing entrepreneurs. It is because they already know a lot about their markets and industry. Hence can effectively apply the learnings in their business and analyze the results more quickly, entrepreneurship development is basically the process of improving the skill set as well as the knowledge of the entrepreneurs. Agri-exports face certain constraints that arise from conflicting domestic policies relating to production, storage, distribution, food security, pricing concerns etc. Unwillingness to decide on basic minimum quantities for export makes Indian supply sources unreliable. Higher domestic prices in comparison to international prices of products of bulk exports like sugar, wheat, rice etc. make our exports commercially less competitive. It is generally the policy that imports duties should be low for those sensitive essential products where there is a large domestic shortfall in production. Pulses are a typical example, where there is zero import duty.

Keywords: Agricultural marketing, entrepreneur, import, exports.

CROPPING PATTERN OF THE AWARDEE FARMERS FOR IMPROVING THE AGRICULTURE IN THE KONKAN REGION
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Present study was conducted in Ratnagiri, Raigad, Sindhudurg, Thane and Palghar districts of of Konkan region. The sample was constituted 60 ‘State agricultural award’ received farmers drawn from different villages of Konkan region. The ex-post-facto research design was used for the present study. The analysis of data revealed that, majority (73.33 per cent) of the respondents were ‘middle’ age, 40.00 per cent had ‘higher secondary’ education, ‘medium’ (73.33 per cent) farming experience, ‘medium’ (40.00 per cent) size of land holding, ‘medium’ (46.67 per cent) annual income and undergone ‘medium duration’(56.66 per cent) training. Nearly three fourth (70.00 per cent) of the respondent had ‘fair’ cropping pattern, whereas 11.66 per cent had ‘best’ and 8.34 per cent respondent had ‘poor’ cropping pattern. The cropping pattern of awardee farmers were quite diversified, as they were found cultivating up to twenty different crops. They followed the sequential cropping pattern like ‘rice-fruit crops’ (10.00 per cent), ‘fruit-flowers’ (3.34 per cent), ‘fruit-vegetable’ (10.00 per cent), ‘rice-fruit-vegetables’ (45.00 per cent), ‘rice-fruit-flower’ (6.66 per cent), ‘rice-fruit-vegetables-flowers’ (25.00 per cent). It was seen that majority (83.33 per cent) of the awardee farmers were growing rice and finger millet (6.60 per cent) in kharif season. In Rabi season, the they were found growing various crops namely, lablab bean (30.00 per cent), cowpea (23.33 per cent), okra (28.33 per cent), capsicum (31.66 per cent), brinjal (35.00 per cent). The awardee farmers from Konkan were growing watermelon (31.66 per cent) crop in summer season. They were also growing papaya (6.66 per cent) crop annually. Perennial crops, mango (71.66 per cent), coconut (26.66 per cent), cashew nut (48.33 per cent), sapota (43.33 per cent), arecanut (31.66 per cent) and banana (33.33 per cent) were dominated in the field of awardee farmer. Flower crops like lily (26.66 per cent) and michelia champa (11.66 per cent) were grown in nursery areas of awardee farmers for commercial purpose.

Venue: Sardar Patel Auditorium, Swami Vivekanand Subharti University, Meerut (U.P.) India 20-22 October, 2018
Agricultural growth can be sustained by promoting conservation and sustainable use of scarce natural resources (soil and water) through appropriate specific measures. Indian agriculture predominantly rain-fed covering about 60% of the country net sown area and accounts for 40% of the total food production. Thus Conservation of natural resources in conjunction with development of rain-fed agriculture holds the key to meet burgeoning demand for food grain country. New agenda in Indian agriculture should have a goal that explicitly focuses on improving agricultural system and addresses rural development in an integrated manner. Towards this end, National Mission for Sustainable Agriculture has been formulated for enhancing agricultural productivity especially in rain-fed areas and focusing on integrated farming, water use efficiency, soil health management and synergizing resources conservation. National Mission on Sustainable Agriculture planning has been designed by converging, consolidating and subsuming all ongoing as well as newly proposed activities and programmes related to sustainable agriculture. NMSA is expected to transform Indian Agriculture into more climate resilient production system through suitable adaptation and mitigation measures in domains of both crops and animal husbandry, so that agricultural production continues to grow in a sustainable manner. This paper describes the objectives, strategies, and structure along with the component of National Mission on Sustainable Agriculture and review the performance of it.

Keywords: Sustainable Agriculture, NMSA

**IMPACT OF MID-HIMALAYAN WATERSHED DEVELOPMENT PROJECT ON EMPLOYMENT GENERATION AND PROBLEMS FACED BY BENEFICIARY FARMER’S IN HIMACHAL PRADESH**

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The present study was analyzed “Impact of Mid-Himalayan watershed Development project on employment generation and problems faced by beneficiary farmer’s in Himachal Pradesh”, the results revealed that the beneficiary farms labour employed on agriculture, horticulture, forestry, livestock and off farm activities for 172 mandays, 28 mandays, 33mandays, 247.50 mandays and 10 mandays, respectively with a total of 490.50 mandays and non-beneficiary farmers was 97 mandays, 24 mandays, 26 mandays, 157.50 for different activities in a year. Thus, it can be concluded that as the farm size increased the employment of labour (mandays/family/year) also increased. Therefore, under overall farm situation the number of labour employed on agriculture, horticulture, forestry, and livestock was 77.32 per cent, 24 percent, 26.92 per cent and 57.14 per cent higher on beneficiary farms as compared to non-beneficiary farms. The major problems coming in the way of watershed development areas were the inadequate training of the farmers about the use of watersheds (70 %), lifting of water from check dam (66.67%), lack of market facilities for farm output (63.33%), lack of knowledge about seed treatment (63.33%), lack of outside field visits (50%), lack of coordination among beneficiaries (50%) and lifting of water from check dam (66.67%) in the study area.

**Keywords:** Impact, Watershed, employment, beneficiary, non-beneficiary

**ENTREPRENEUR’S QUALITIES AND ENTREPRENEURIAL SKILLS FOR AGRIPRENEURSHIP**

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Entrepreneurs are those people who exhibit common traits such as single-mindedness, drive, ambition, creative, problem solving, practical, and goal-oriented. An entrepreneur is an individual who recognizes an opportunity or unmet need and takes the risk to pursue it. He needs to develop these abilities, managing productivity and seeking out new markets. Personal qualities of an agri-entrepreneur significantly affect the agribusiness Self-criticism, leadership, market orientation and creativity is important for successful entrepreneurship development. Entrepreneurship skills are considered to be those competencies required to accomplish tasks and activities related to the farm business. These can be developed by learning and experience. Hanf and Muller suggest that in a dynamic environment with fast technical progress, open minded farm entrepreneurs will recognise more problems than they are able to rationally solve. Man et al., (2002) categorized entrepreneurial competences in six key areas which includes opportunity recognition skills, relationship building, Organizing, Strategic competences, conceptual thinking and problem solving skills. Lauweres (2002) study of weaknesses in entrepreneurship and selected seven critical success factors which are management and strategic planning, knowledge of the ecosystem, capable and professional staff, understanding of the value chain perspective, craftsmanship, ability to learn and
seek opportunity and enterprising personal characteristics. Thus, management skills are the complete package of skills that a farmer would use in order to develop the farm business.

**Key words:** Agriculture, Entrepreneurship

## ROLE OF EDUCATION IN WOMEN EMPOWERMENT

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Education increases people's self-confidence and enables them to find better jobs and they can work shoulder to shoulder with men. They engage in public debate and make demands on government for health care, social security and other entitlements. In particular, education empowers women to make choices that improve their children's health, their wellbeing, and chances of survival. Education informs others of preventing and containing disease, and it is an essential element of efforts to reduce malnutrition. Furthermore, it empowers women to make choices that can improve their welfare, including marrying beyond childhood and having fewer children. Crucially, education can increase women's awareness of their rights, boost their self-esteem, and provide them the opportunity to assert their rights. Despite significant improvements in recent decades, education is not universally available and gender inequalities persist. A major concern in many countries is not only the limited numbers of girls going to school, but also the limited educational pathways for those that step into the classroom. More specifically, there should be more efforts to address the lower participation and learning achievement of girls in science, technology, engineering and mathematics (STEM) education.

Keywords: Education, Knowledge, Entitlement, Skills, Technology, etc.

## HACCP IMPLEMENTATION ON BEER PRODUCTION FROM BARLEY

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The production of beer is called brewing, beer is considered a safe beverage; however, its degree of safety may be comparable to many other food products. Many hazardous situations may arise during the production of beer. The major steps in producing malt & beer include: barley intake, cleaning & grading, drying, steeping, germination, kilning malt, roasting, milling, mashing, boiling, fermenting, maturing, filtration and packaging or bottling. These steps should be analyzed to effectively apply the HACCP (Hazard Analysis and Critical Control Points) method to control food safety. It is in the public interest that beer producers, especially at brewing pubs and microbreweries, develop and implement HACCP plans to ensure the safety of beer. The most effective way to active food safety is to focus on prevention of possible hazards and to improve the process. HACCP can be considered as a management tool. It is a simple but specialized method designed to prevent health hazards resulting from the consumption of contaminated food and beverages. Health hazards may originate at any point in a production process, including receipt of raw materials, food handling, storage, packaging and transportation. The knowledge of the product formula and the details of the process are basic tools necessary to apply the HACCP method. It is very important to remember that HACCP is an analytical approach to food safety, focusing on critical points or areas of a food process which may present a hazardous situation in need of control.

Key word: - beer, hazards, HACCP, food safety.

## ROLE OF DIFFERENT SOCIO-ECONOMIC FACTORS IN FARMER SUICIDES AND ITS MITIGATION

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Agriculture is the backbone of Indian economy still agriculture is not a profitable occupation for many who are practicing it, resulting in increasing number of suicide by farmers. The lacuna in the agricultural sector is small land holdings, over dependency on monsoon, insufficient irrigation facilities, lack of proper credit and insurance facilities, etc. The erratic climatic changes during last decade have aggravated the problems in farming sector; manifestations of these in extreme situations can be seen in the form of farmers' suicides. During the duration of 1998-2018, nearly 300,000 farmers have committed suicide in our country, often by consuming pesticides. In India, 11.2% of the total suicides are by farmers. In 2015, 795 out of 1,562 suicides committed by farmers/cultivators due to farming related issues were reported in Maharashtra alone, accounting for 50.9% of total such suicides in the country during that year. There can be many reasons behind a farmer suicide. According to a survey in India, 38.7% suicides are due to bankruptcy or indebtedness followed by farming related issues (19.5%), illness (10.5%), drug abuse (4.1%), marriage related issue (2.0%), poverty (1.1%) and property dispute (1.1%). Government have introduced many polices like subsidies, loan waivers, crop insurance and other welfare schemes but they have failed due to improper implementation and their reach to the farmers. Problem of farmer suicides can be mitigated by educating farmers, protecting them from falling into trap of spiraling debt by providing easy loan by government banks, fair compensation, training in agriculture and allied activities to obtain a secondary income, protection from crop failures and making farming profitable. Small and marginal farmers should be encouraged to form farming cooperatives by pooling their land resources and get advantages that come with larger land holdings such as farm mechanization, better water and crop management. This paper aims to study and comprehend different reasons and current scenario in our country that is leading to farmers' suicide and also suggesting ways to mitigate these problems.

ROLE OF MOBILE PHONE TECHNOLOGY IN IMPROVING SMALL FARM PRODUCTIVITY

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Telecommunication, especially mobile phones have the potential to provide solution to the existing information asymmetry in various lagging sectors like agriculture. India’s agricultural sector suffers from low growth rates and low productivity. Issues in access to information are weak points at every stage of the agri-supply chain. For small farmer-based economy like India, access to information can possibly enable better incomes and productivity to the farmers. This paper through focus group discussions and in-depth interviews with farmers, has tried to find answers to the use and impact of mobile phones and mobile-enabled services on agricultural productivity. The answers to these questions are of relevance to develop better policy environment conducive for small and medium farmers and have implications for mobile phone operators, information service providers, and policymakers. The study has shown that although, mobile phones can act as catalyst to improving farm productivity and rural incomes, the quality of information, timeliness of information and trustworthiness of information are the three important aspects that have to be delivered to the farmers to meet their needs and expectations. There exist critical binding constraints that restrict the ability of the farming community to realize full-potential gains and it is more so for small than large farmers. Information-based, decision-making agricultural system (Precision Agriculture) is designed to maximize agricultural production and is often described as the next great evolution in agriculture. The combination of Global Positioning System (GPS) and mobile mapping are supposed to provide farmers with the information for implementation of decision-based Precision Agriculture (Michael, 2008).

IMPACT OF GST ON FARMERS

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In 1991, India saw an LPG blast — liberalization, privatization and globalization that changed the face of the country permanently. After 25 years from 1991, a fortnight ago, we experienced another revolutionary reform — GST with the promise of “One country-One tax”. I really wish the Government thought more wisely about essential technology tools for climate-smart farming such as drip irrigation, greenhouses and shade nets. They should ideally be designated under the ‘Zero GST’ category along with food, milk, etc, as this will be essential for us to ensure farmer prosperity. The impact of GST on agricultural sector is foreseen to be positive. The agricultural sector is the largest contributing sector the overall Indian GDP. It covers around 16% of Indian GDP. The implementation of GST would have an impact on many sections of the society. One of the major issues faced by the agricultural sector is the transportation of agriculture products across state lines all over India. GST is essential to improve the transparency, reliability, timeline of supply chain mechanism. Under the model GST law, dairy farming, poultry farming, and stock breeding are kept out of the definition of agriculture. Therefore these will be taxable under the GST. Fertilizers an important element of agriculture was previously taxed at 6% (1% Excise + 5% VAT). In the GST regime, the tax on fertilizers has been increased to 12%. The same impact is on Tractors. Implementation of GST is going to benefit a lot, the farmers/distributors in the long run as there will a single unified national
agriculture market. GST would ensure that farmers in India who contribute the most to GDP, will be able to sell their produce for the best available price.

GERIATRIC NUTRITION: IMPORTANCE
KIRTI M. TRIPATHI, S. K. DUBEY, AMIT SINGHA AND SATISH KUMAR

Old age is one of the vulnerable and prone stages in terms of health status. Nutrition is essential determining factor of elderly mass specifically over the age of 60 years. Geriatric nutrition has been always underreported, though everyone wants to make the senescence easy. Adequate nutrition is always important for better ageing. Physical activities are also in the same queue of building the ageing an easier process. Health conditions like hypertension, cholesterol, renal failure, joint problems and cardiac problems should be taken into consideration before starting any kind of physical activity. The magnitude of malnutrition among the elderly in India is underreported. Studies have shown that more than 50% of the older population is underweight and more than 90% has an energy intake below the recommended allowance. Therapeutic diets should be inculcated in any kind of bodily ailment. It is found that in India elderly are usually suffered from micro nutrient deficiency, which should also be given emphasis. Scarcity of awareness, prejudice, depression and loneliness are some of the factors behind the increased vulnerability of nutritional deficiency related ailments. Small interventions can make the ageing better. Reduced sodium intakes become important, as blood pressure tend to increases in women over age 60. Serum cholesterol levels peak for men at age 60 but continue to rise in women until age 70. Immunity decreases with progressing age and make the body less able to fight infections and malignancies. Vitamin E, zinc, and some other supplements may increase immune functions.

Key words: Geriatric population, Malnutrition, Ageing, Nutrition, Awareness.

ROLE OF FARM WOMEN: NEED OF AWARENESS GENERATION
KIRTI M. TRIPATHI

Women plays a dynamic role in India’s agro based economy and household chores. In western Uttar Pradesh 95% of rural women are involved in agricultural practices. The rural women are involved in activities starting from land preparation to harvesting. If we talk about home then also women is efficiently managing all the chores without any expectation. Still in India women are not that free to move out of their farms and homes. At home level also they face so many obligations regarding their managerial qualities. Productivity in terms of health, time management, work simplification and drudgery reduction can be increased by making them aware of using the existing technologies with utmost efficiency. Therefore it is essential to provide them the relevant information on improved home and farm managerial practices through trainings which is actually an important mandate of KVKs. To be effective, trainings must be based on the need and interest of the learner and should deal with their real problems. Organizing on and off farm trainings on potential oriented technologies will be helpful in increasing the rate of technological adoption. Therefore identification of training needs of farm women is very important before organising a training programme for them. Seven areas of Home and farm practices namely diet efficiency, storage loss minimization, income generation, drudgery reduction, Women and child care, health and hygiene are there.

HOUSEHOLD FOOD AND NUTRITIONAL SECURITY FROM LOCALLY AVAILABLE FOODS
KIRTI M. TRIPATHI

According to World food summit 2008, all people, at all times, have physical, economic and social access to sufficient, safe, and nutritious food to meet their dietary needs and food preferences for an active and healthy life. Good nutrition means eating the right food, at the right time, in the right amounts (quality and quantity) to ensure a balanced diet. Food should be prepared in a clean, safe way and stored safely. To ensure good nutrition, households must be careful to keep enough food or money to meet the family’s dietary needs, or the household may face malnutrition. As per Committee on World Food Security, 2012, all people at all times have physical, social and economic access to food, which is safe and consumed in sufficient quantity and quality to meet their dietary needs and food preferences, and is supported by an environment of adequate sanitation, health services and care, allowing for a healthy and active life. Whole grains are included in staple Indian diet and is easily available. Whole grains provide us energy giving carbohydrate, vitamin B complex, dietary fibre, minerals and essential fatty acids. Polishing rice removes the bran and germ & uncovers the endosperm. This raises rice’s glycaemic index & strips away vitamins (A,B,K,E), fibre, magnesium and essential amino acids that can help prevent diabetes. Beans and lentils such as rajma, kabuli chana, soybean, moong contain certain anti carcinogenic compounds and are also loaded with fiber which maintains digestive health, keeps blood sugar under control and reduces cholesterol levels. Bananas are high
in soluble fibre, magnesium, potassium and natural sugars. Summer vegetables include bottle gourd, pumpkin, beans, egg plants etc have antioxidant properties which also helps to minimize skin damage that is caused due to exposure to sun in summer. Flaxseed is very essential for vegetarian eaters as they are abundant in omega 3 which is not highly available in other vegetarian food items. They aid in lowering blood pressure, triglycerides and blood cholesterol levels.

GENDER MAINSTREAMING IN AGRICULTURE AND ALLIED SECTORS FOR ENHANCING FOOD AND NUTRITIONAL SECURITY

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Agriculture is by and large an enterprise which engages women and men in different activities with varying degrees of their participation. Productivity of women compared with men farmers remains low relative to their potential as they are left behind in trainings, extension support services etc. Research shows that women farmers are as efficient as men farmers, controlling for other characteristics, agriculture is becoming feminized, attention to gender facilitates the achievement of economic and social objectives. Ignoring gender can lead to lopsided development and project failure. In India 65 per cent of food is produced by women. 44 per cent of total world food production is done by women. But only 2 to 10% of agriculture support services are received by them. Gender equity entails the provision of fairness and justice in the distribution of benefits and responsibilities between women and men. The concept recognizes that women and men have different needs and power and that these differences should be identified and addressed in a manner that rectifies the imbalances between the sexes. Women comprise 65 percent of the agricultural workforce, with 79 percent of rural women engaged in agricultural activities. Women farmers generate a significant proportion of their household’s income, leading to improved quality of life, health and education. She produce a large proportion of food consumed locally and contribute to the food and nutrition security of families. Women’s equal access to agricultural inputs will increase their agricultural productivity by 20 to 30 percent. Gender parity in agriculture can reduce the number of hungry people in the world by 12 to 17 percent, thereby contributing to global food security.

WASTE MANAGEMENT OF FRUITS

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During the canning of fruits and preparation of juices, jam, jellies, etc., large quantity of waste material is generated and in some fruits discarded portion can be very high eg. Mango 30-50%, banana 20%, pineapple 40-50% and orange 30-50% and a producer has to dispose of the peel, rags and seeds of citrus fruits, the core and the peel of guavas and seed, the peel and stones of mangos, rind and seed of jackfruit. But from these waste material products can be made like candied peel, oils, pectin, reformed fruit pieces, enzymes, wine/ vinegar etc. Peel from citrus fruits (orange, lemon and grape fruit) can be candied for use either in baked goods or as snack food. Shreds of peel are used in marmalades and the process is similar to candying. The stones of fruit contain appreciable quantities of oil or fat, used for culinary or toiletry applications. Palm kernel oil is well established as both as cooking and industrial oil. Fruit pulp can be recovered and formed into synthetic fruit pieces. We can extract enzymes from fruits like papain from papaya, bromelain from pineapple and ficin from figs these are protein degrading enzyme used as meat tenderisers, washing powders, leather tanning and beer brewing. Beers and wines are also possible products although these are produced from fresh, high quality fruit juices to obtain high quality. By using these all practices we can manage our fruit wastes.

ASSOCIATION BETWEEN CONSTRAINTS ENCOUNTERED BY THE FARMERS IN ADOPTION OF DRIP IRRIGATION SYSTEM AND THEIR SELECTED INDEPENDENT VARIABLES

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Water is the most precious natural resource, vitally important for agricultural development and for day-to-day living. In the increasing alternative demand of municipal and industrial sector that means less water available for agriculture. In Rajasthan, irrigation scenario of Rajasthan is characterized by erratic or sporadic/scanty rainfall, dwindling ground water resources, negative moisture index, poor soil quality and traditional agriculture practices, the food security, nutritional security, Rajasthan has largest geographical area having only 1% water resources of country. Due to arid and semi-arid climate "i.e. negative moisture index, poor soil quality and traditional agriculture practices, the food security, nutritional security, irrigation scenario of Rajasthan is characterized by erratic or sporadic/scanty rainfall, dwindling ground water resources increasing alternative demand of municipal and industrial sector that means less water available for agriculture. In Rajasthan, Water is the most precious natural resource, vitally important for agricultural development and for day-to-day living. In the changing agricultural scenario world over and shift towards precision farming, drip irrigation happens to be the technology capable of providing more efficient utilization of water. The study was conducted in eight selected Gram Panchayat of Jhotwara Panchayat Samiti of Jaipur District of Rajasthan. Two villages were selected from each selected Gram Panchayat of Jhotwara Panchayat Samiti having maximum number of drip irrigation sets. Thus, sixteen villages were selected purposively. Ninety six farmers were selected from sixteen selected villages on the basis of proportional allocation to the size of sample. The seven variables viz. socio-economic status, caste, occupation, education level, size of land holding, age and extension participation were identified as the important variables to measure the association between the constraints encountered by the farmers in adoption of drip irrigation system and selected independent variables and following results were found. It was observed that ‘socio-economic status’, ‘caste’, and ‘education level’ were found to be negative and significantly where as ‘occupation’ and ‘extension participation’ were positive and significantly associated with the constraints encountered by the farmers in adoption of drip irrigation system while the variables like ‘size of land holding’ was negative and ‘age’ was positive but both were non-significantly associated with the constraints encountered by the farmers in adoption of drip irrigation system.

NANOTECHNOLOGY –A NOVEL APPROACH IN AGRICULTURE
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Nanotechnology is one of the most fascinating and rapidly advancing science in agriculture that contribute to sustainable competitiveness and growth in several industrial sectors. The current challenges of sustainability, food security and climate change are engaging researchers in exploring the field of nanotechnology as new source of key improvements for the agricultural sector. Conversion of macromaterials into nanosize particles (1-100nm) gives birth to new characteristics and the materials behaves differently. Nanotechnology has various applications in plant protection especially in smart drug dellicery systems in plant disease management, disease diagnosis by using nanosensors, chemical residual analysis and in the production of nanostructured devices in plant breeding and genetic transformation. On the other hand, industry experts stress that agricultural nanotechnology does not demonstrate a sufficient economic return to counterbalance the high initial production investments. However, recent studies demonstrate that public opinion is not negative towards nanotechnology and that the introduction on the market of nanotech products with clear benefits will likely drive consumer acceptance of more sensitive applications. The rapid progress of nanotechnology in other key industries may over time be transferred to agricultural applications as well, and facilitate their development.

IMPACT OF MUSHROOM CULTIVATION ON SOCIO-ECONOMIC STATUS OF RURAL WOMEN IN SAMASTIPUR DISTRICT OF BIHAR
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The main purpose of this study was to determine the impact of mushroom cultivation on socio-economic condition of rural women. Recently unemployment is increasing rapidly both in developed and developing countries. In this situation, self-employment can be one important way to increase employment rate for small, marginal poor farm households for generating employment and earning extra money. They can easily cultivate mushroom in their home yard because it requires small piece of land where mushrooms can be grown. Mushroom cultivation might serve as means of generating employment, particularly for rural women and youths in order to raise their social status. By practicing mushroom cultivation farmers can contribute successfully and significantly to the economic development. Women constitute almost fifty percent of the entire population. Rural farm women are invisible in statistics while women are extensively involved in agricultural activities. Mushroom are the natural gift to human being which is rich in vitamin B complex including folic acid and B12 high protein with negligible starch and sugar high potassium/sodium ratio low fat. Mushroom cultivation does not require very high investment or heavy infrastructural.
Mushroom cultivation might serve as means of generating employment, particularly for rural women and youths in order to raise their social status. By practicing mushroom cultivation farmers can contribute successfully and significantly to the economic development. It will also provide additional work for the farmers during winter months when the farming schedule is light. So, mushroom cultivation plays a vital role for socio-economic development of mushroom beneficiaries. The study was conducted in Samastipur district of Bihar. Total 75 rural women were selected from adopted villages. Relevant data were collected with the help of personal interview. The data were analyzed using appropriate statistical tools. The finding indicates that majority of the respondents ie 44 percent were 15-35 years aged belong to backward cast having medium educational level medium size of landholding. Majority of them were from large family size with medium level of family income and farm size. Our study was the impact of mushroom cultivation training programme on socio-economic status of rural women and constrain faced by them.

MANAGEMENT OF INTELLECTUAL PROPERTY RIGHTS IN INDIA

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The World Trade Organization’s agreement on Trade-Related Aspects of Intellectual Property Rights set global minimum standards for the protection of intellectual property, substantially increasing and expanding intellectual property rights, and generated clear gains for the pharmaceutical industry and the developed world. IPR can be held only by legal entities, i.e. those who have the right to sell and purchase property. In other words, an institution that is not autonomous may not be in a position to own an intellectual property. IPR as a collective term includes the following independent IP rights, which can be collectively used for protecting different aspects of an inventive work for multiple protection: Patents, Copyrights, Trade secrets Trademarks, Registered (industrial) design and Protection of IC layout design. Geographical indications and Protection of undisclosed information. The evidence in this study of innovation and intellectual property rights (IPR) protection strongly supports the view that effective economic institutions matter, even in India. In order to successfully transition the country from a development model dependent on cheap labor and physical investments to one that is innovation-driven, these results suggest that the role of the private sector will be crucial. Private firms are more innovative both in terms of quantity and quality of patents, and are more so in cities with strong IPR protection.

Keywords: Copyright, geographical indication, industrial design rights, patents, trade secrets and trademark.

MARKETING CHANNEL OF MENTHOL MINT (MENTHA) IN SITAPUR DISTRICT, UTTAR PRADESH

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The present study has been conducted in order to access the marketing of menthol in the state of Uttar Pradesh, India. Multi-stage sampling technique was used to select blocks, villages and the respondents from the four villages of two blocks in Sitapur district. A pooled list of all mentha growers was prepared for all selected villages and a sample of 60 farmers was obtained using probability proportion to size method. Two distribution channels were identified. The marketing of menthol is dominated by processor (Channel-1). Around 73 per cent produce was marketed through channel I. Marketing cost varied from Rs. 156 per kg in channel I to Rs. 162 per kg in channel II. A component of the marketing cost of the producer was cost incurred on distillation and processing of menthol. Producers’ share in consumer Rupee is high i.e. 87.30 per cent in channel 1 while it was 83.10 per cent in channel II respectively. Even though the mentha cultivation is profitable, there are lot of lacuna in marketing of menthol oil like lack of awareness about export market and existence of intermediaries between farmers and processors/industries. Hence, there is immediate need to organize marketing of menthol through cooperative lines in the study area.

Keywords: Menthol mint, Mentha, Marketing efficiency, Marketing margins, Price spread

FARM ENERGY BALANCE AND MANAGEMENT: THE SOCIO-ECOLOGICAL, ECONOMIC AND ENVIRONMENTAL ANALYSIS

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Rice is not only the staple food of many countries but it is also a source of earning of millions of people. In India, rice farming is the major source of income of the farmers which is highly dependent on the energy inputs. Energy is the prime mover of economic growth, and is vital to sustaining a modern economy and society. Energy management is the judicious and effective use of energy to maximum profits (minimum costs) and enhance competitive positions. Efficient usage of energy in agriculture will minimize environmental causes, prevent destruction of natural resources and promote sustainable agriculture. The fundamental goal of energy management is produce goods and the least environment effect. Keeping this energy entropy in view, the present study on “Farm Energy Balance and Management: The Socio-ecological, Economic and Environmental Analysis” has been selected to study the energy balance i.e., metabolism, consumption and production in rice and efficient energy management as well as its overall impact goes on social, economic, ecological spheres of ecosystem. The study was conducted at villages namely Tulsi, Tarighat and Sipkonha of Patan block in Durg district of Chhattisgrah. It includes a set of depended variables i.e. Energy consumption in rice crop (Y₁), Energy balance in rice crop (Y₂), Energy metabolism in rice crop (Y₃), Adoption level of efficient energy management in rice crop (Y₄), Perception of energy management in rice crop at community level (Y₅) and Economic cost-benefit ration of rice crop (Y₆) to be estimated through a set of 24 exogenous variables i.e. Age(Xᵢ), Education(Xᵢ), Gender ratio(Xᵢ), Size of family(Xᵢ), Farm size(Xᵢ), Occupation(Xᵢ), Cropping intensity(Xᵢ), Irrigation index(Xᵢ), Expenditure allotment (Xᵢ), Annual income(Xᵢ), Amount of cow dung applied in farm (Xᵢ), Implement use(Xᵢ), Farm materials(Xᵢ), No. of fragments(Xᵢ), Distance of fragments(Xᵢ), Training received(Xᵢ), Crop diversity(Xᵢ), Animal husbandry(Xᵢ), Farming experience(Xᵢ), Harvest index(Xᵢ), Production per unit area(Xᵢ), Communication media interaction(Xᵢ), Market interaction(Xᵢ) and Crop energy efficiency(Xᵢ). The respondents have been 105 by count and have been selected through both purposive and random sampling approaches to ultimately derive and elicit their behavioral traits in characterizing energy balance and management of social, economic, physical ecological setup. The results show that following factors Age, education, Cropping intensity, Expenditure allotment, Annual income, Farm materials, No. of fragments, Distance of fragments, Training received have led to consciousness about the energy balances in social ecology and impact of these energy balance on the ecosystem as whole. All these analytical outcomes can be replicated to other enterprises as well to calculate energy balances. The principle components analysis has isolated 5 factors through an operationally conglomeration of 24 explanatory variables responsible for farm energy balances. All these outputs can be replicated to other enterprises as well to calculate energy balances. The present study has been a modest attempt to audit on the happening energy metabolism, that is, a subtle balance between energy invested and energy generated from per unit area farm functioning. This will ultimately lead to a sustainable production function in agriculture and allied sectors’ with ecological implication as well. So level of energy consumption and the elements of modernity are also to be reticulated and operationally orchestrated.

**Keywords:** Farm Energy Management, Energy Balance, Energy Metabolism, Energy Consumption, Social Ecology, Entropy.

**DOUBLING THE FARMERS INCOME THROUGH INNOVATIVE APPROACH**

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The agriculture based Indian Economy needs high agriculture income for the farmers who feed the 1.25 billion Indian population. Not only this like developed countries who despite having much lesser area under cultivation, export number of farm products, This will attract more and more people towards agriculture, the backbone of the country. The Prime Minister Narendra Modi said that his government has decided to double the farmers’ income by 2022 when India would celebrate 75 years of Independence. The goal is achievable if the farmers adopt and use modern technology in cultivation like drip irrigation as it will direct the maximum utilization of water with minimum quantity. The Prime Minister said “Water is like God, we have no right to waste it.”. The focus will then be on “More crop per drop”, “Hark khet ko pani” (water for every farm), “Doubling farmers’ incomes”. Laying the route map to double the farmers income, the Prime Minister said “Centre has decided to double farmers’ income by 2022 by improving technology, increasing milk production, use of solar light, honey production. The NITI Aayog has already come out with its ‘Three Year Action Agenda’ – a plan that covers a time period up to the 2019. In its chapter on agriculture titled ‘Agriculture: Doubling Farmer’s Incomes’, the economic think-tank has put forth a 4-point action plan to double the incomes of India’s farmers. A subsidy would be provided on targeted produce in case the price falls below MSP-linked threshold. One advantage of this, as highlighted by the action plan, is that it would spread price incentives to producers in all the regions and all the crops considered important for providing price support. NITI Aayog has also called for substantive investment in irrigation, seeds & fertilisers and new technology coupled with a shift into high-value commodities such as horticulture, poultry and dairying to double incomes.

**Keywords:** NITI Aayog, “Hark khet ko pani”, “Doubling farmers’ incomes”, Indian Economy
ROLE OF SOIL PHYSICS FOR ENHANCING SOIL PRODUCTIVITY

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Soil in its natural state rarely provides the most favourable physical conditions for crop growth. Plants require soil to obtain water and nutrients for growth and stability. Seeds will germinate, seedlings emerge and grow to produce a crop under a great variety of conditions. For satisfactory plant growth, it is essential that the soil provides a favourable physical environment for root development that can exploit the soil sufficiently to provide the plant's needs for water, nutrients and anchorage. Agricultural production depends very much on the physical properties of the soil, and mainly on those related to the soil's water holding and transmission capacities. These properties affect the availability of water to crops and may, therefore, be responsible for crop yields. The knowledge of the physical properties of soil is essential in defining and/or improving soil water management practices to achieve optimal productivity for each soil/climatic condition. Soil retention is a major soil water property that governs soil functioning as an ecosystem. The effects of changes in soil water retention depend on the proportions of the textural components and the amount of organic carbon present in the soil organic matter is one of the most important biophysical elements that can be managed to improve soil physical health and resilience. Incorporation of organic matter either in the form of crop residues or FYM has been shown to improve soil structure (aggregate stability) and water retention capacity, increase the initial and steady infiltration rates and decrease bulk density, resulting in reduction in crust formation and consequent increase in water productivity.

Key words: Soil physical properties, Soil water retention, organic matter

BETALAINS – ROLE IN CARDIOVASCULAR DISEASES AND THALASSEMIA

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Betalains are water-soluble nitrogen containing pigments, which are synthesized from the amino acid tyrosine and consist of two structural groups: red-voilet betacyanins and yellow-orange betaxanthins. (Azeredo, 2009). Betalains are used for food coloring in products such as ice cream, candies, and processed meat and the quantity in these foods rarely exceeds 50mg/kg due to their strong pigment coloration (Vargas et al., 2000). The majority of plants containing betalains are in the caryophyllales family (Moreno et al., 2008). Betalains strongly reduce oxidized LDL cholesterol and protect against cardiovascular diseases. Betalains can bind to LDL and the oxidation of LDL appears to be inhibited by both betanidin and betanin (Guzman-Maldonado et al., 2010). The Regular ingestion of Opuntia robusta (500g/day) is able to significantly reduce LDL in a group of patients suffering from hypercholesterolemia (Tessoriere et al., 2004). Betalains assist the body in...
a total transformation by neutralizing toxins and supporting the cell’s natural detoxification process. They prevent toxins from accumulating and preserve the integrity of the cell and control chronic inflammation. They also reduce the enzymes responsible for causing inflammation, thus protect against CVDs. Betalains protect the thin lining of blood vessels and this helps to reduce the inflammation that makes your blood sticky and leads to clots. Betalains provide significant protection from toxins that directly affect liver (Stintzing et al., 2004). Thalassemia is a blood disorder passed down through families (inherited) in which the body makes an abnormal form of hemoglobin. The disorder results in large numbers of red blood cells being destroyed, which leads to anemia. Betalains play indirect role in thalassemia minor by inhibiting the hemolysis of RBCs and increasing the life of cells. (Tessoriere et al., 2005).

Keywords: Betalains, Cardiovascular disease, hypercholesterolemia and Thalassemia

STUDY ON PHYTOCHEMICAL CHARACTERIZATION AND ANTIBACTERIAL ACTIVITY OF FRUIT TREES OF CHAMOLI DISTRICT, UTTARAKHAND

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Rubus ellipticus, Berberis aristata and Ziziphus maurintina are perennial herb from the Himalayas, found to grow on damp, old walls in chamoli. Ethnobotanically, juice of the plants are sore the fruits and applied to food, like a small size red, blue berry and golden pulp. The present study was carried out on the phytochemical characterization and antibacterial activity of the local fruit yielding plants in Chmoli Gharwal. Plant material was subjected to extraction using ethanol solvent. Phytochemical screening of the extract showed the presence of alkaloids, proteins, carbohydrates, cardiac glycosides, tannins and phenolic. The extract of the plants were assayed for antibacterial activity against the pathogenic bacterial strains. Out of the extracts assayed, the ethanol extracts was most active against the four gram positive and one gram negative bacterial stain while the ethanol extract was most active against. Maximum zone of Inhibition against (Antibacterial activity) E. faecalis strains and minimum inhibitory concentration also E. faecalis showing zone of inhibition. Therefore, minimum inhibitory concentration (MIC) of these extracts was determined against the selected bacteria showing zones of inhibition. The MIC for different strains range between 12mg/ml to 17mg/ml. So, it can be concluded that ethanol extract of possess good antibacterial activity that can be enhanced if the phytoactive components are purified and adequate dosage is determined for proper administration.

REASONS AND SATISFACTION LEVEL OF USING CASHLESS PAYMENT METHODS BY RESPONDENTS

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The present study was conducted in Hisar district of Haryana state covering 200 respondents from two localities viz., rural and urban. Results shows that majority of the respondents always utilized mobile banking as it is secure and risk-free and bankcards as they provides details of transactions and rarely utilized internet banking as they found it difficult to operate. As far as reasons for not using mobile phone as they do not trust the providers behind the app, not sure of using internet banking and did not use bankcards due to high interest rate and increased debt. Majority of respondents were satisfied with the number of transactions and quality of notes of ATM services; due installment enquiry of internet banking services; prepaid mobile recharge and clear instructions from tele phone banking services. Rao (2004) also aimed at comparing the marketing strategies of two of the commercial banks — Citi bank and Andhra bank. He also evaluated the customer satisfaction with respect to their credit cards and suggested necessary steps for promoting credit card business by considering its benefit and scope in the business.

Keywords: Mobile banking, internet banking, mobile phone, satisfaction

APICULTURE: A GROWING TREND IN INDIA

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Apiculture or bee-keeping is a technique of rearing honey bees for honey, wax, royal jelly and propolis as well as for increasing the crop yield. India is one of the largest honey producer and exporter in the world that plays an important role in world honey production and trade. In India Apiculture is a growing trend in India. Honey bee farming can be done separately as a commercial honey bee farm to get income from the honey and other by-products or integrated with crops to increase the crop yield. This is because bees play an important role in pollinating many plants. Sunflowers, Cherry, Apple, Citrus, Lily, Lotus and such other crops are highly dependent on bees for pollination. In addition, it does not require huge investments, infrastructure or even a fertile land to start bee farming in India. In agricultural, honey bees do not compete with the crops for resources. There are many by-products like honey, royal jelly, bee wax, pollen, propolis and bee venom. The most valuable by product of apiculture is honey that has a long history of human consumption. It is consumed as medicine, taken as food, or incorporated as an additive in a variety of food and beverages. India has been known as ‘land of honey.’ As per 2016-17 estimates, about 30 lakh bee colonies has been produced 94.5 thousand MT of honey. Yields of honey per colony with supers (20 frames) has increased to 25kg per annum in 2015-16 from 18 to 20 kg per annum in 2014-15. Asian bee (Apis cerana indica) and European bee (Apis mellifera) are important species for bee keeping as these are domesticated in nature. Honey bee farming may help in doubling farmers income by supplementing/complimenting agriculture/ horticulture. Unemployed youth can start this business with minimal funds (Rs. 1.00 to 2.00 lakhs) and can get good returns. Encouraging beekeeping encourages biodiversity.

Keywords: Apiculture, Honey, Growing trend, Pollination, India

ROLE OF POLICIES TO PRODUCE QUALITY SEED OF VEGETABLE CROPS

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Seed is a key component among all inputs for sustainable crop production. It is estimated that quality of seed accounts for 20-25% of productivity. The importance of quality seed has been realized by mankind long ago. “A good seed in a good filed will win and prosper”. In terms of genetic and physical purity is realized for first time during green revolution period with the establishment of National Seeds Corporation (NSC) in 1963. The principle responsibilities of NSC are establishing an adequate system of quality control inspection for scientific processing, storage and marketing of seeds. Policy making and implementations shall be free from political motivations. Few mile stone events in seed policy by Govt. of India are - A. The Seeds Act, 1968. B. National Seeds Project, C. New Seeds Policy, 1988, D. PPV & FRA, 2001. E. The Seeds Bill, 2004. The global seed sector outlook 2025 for major vegetable crop spices such as Brassica (Cabbage, cauliflower, broccoli), cucurbits (Muskmelon, watermelon, cucumber, squash), corn (Baby corn, sweet corn), Legumes (Pea, beans), leafy vegetable (Lettuce, spinach), Root – Bulb (Carrot, radish, onion), and Solanaceae (Pepper, eggplant, tomato) is a dynamic capture of semi-annual long range (10-15 year) forecasting data for global vegetable seed market. Vegetable seeds are the fastest growing category within the overall seed market. Vegetable play a major role in proving an affordable balanced diet. Vegetable seed business will ever have huge scope to success and will play an important role in economy in countries like India Making available quality seeds to the farmers in time and in sufficient quantity at reasonable prices.

SCOPE AND IMPORTANCE OF HONEYBEE FARMING IN INDIA

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Since ages, India is an agricultural country. People are dependent on agricultural goods. Honey is one such product. This honey has an important role in the Indian history. People often use it in the many pooja and all. They mix honey with milk and other items and offer it to the God. Such is the value that it has in India. Earlier there is not much importance for Honeybee farming in India. Earlier it was available in plenty and population is also less. But this is the exact opposite in the current scenario. Hence we are now going to explain the Honeybee Farming Disadvantages and Advantages. Here Honeybee Farming is nothing but Apiculture. Honeybee Farming can boost the income of the farmers. Hence they can rely on this apart from Agriculture. While it can produce a number jobs for the rural India. This, in turn, will decrease the unemployment. There are a number of Environmental Benefits of Beekeeping. Mainly the honey bees are responsible for cross-pollination. Health benefits of beekeeping are too many. Since honey is famous to treat a number of diseases, people can use it as medicine. It can play a big role in the preparation of medicines. With Bee Wax; a number of items can be produced. These are some of the Scope of Apiculture in India. Furthermore, check below to know more about this Apiculture in India.

Keywords: Honeybee, India, Agricultural, Disadvantages and Advantages.

ROLE OF WOMEN IN SERICULTURE AND COMMUNITY DEVELOPMENT
In any discourse on sociology and anthropology, one fact that clearly emerges is that women can generally be trusted to perform their duties with utmost care and attention. This is more so in the case of agriculture and allied activities. No wonder women are playing a very important role in the sericulture industry. Their qualities like maternal instincts and loving care of those under their charge prove to be very helpful in the successful breeding of silk worms. The sericulture industry has opened up phenomenal employment avenues and helped women to become important players in the decision-making process—whether in the household or in the community at large. The active involvement of women is very essential for the success of the any community development initiative. This has been proved on many occasions all over the world.

In any discourse on sociology and anthropology, one fact that clearly emerges is that women can generally be trusted to perform their duties with utmost care and attention. This is more so in the case of agriculture and allied activities. No wonder women are playing a very important role in the sericulture industry. Their qualities like maternal instincts and loving care of those under their charge prove to be very helpful in the successful breeding of silk worms. The sericulture industry has opened up phenomenal employment avenues and helped women to become important players in the decision-making process—whether in the household or in the community at large. The active involvement of women is very essential for the success of the any community development initiative. This has been proved on many occasions all over the world—more so in the developing countries. For instance, the success of Self Help Groups (SHGs) in states of India is all due to the active role played by women. The thrust of this article is on the role of women in promotion of sericulture activities in the village, and how their participation has led to community development. Given the above backdrop, the present article is based on an empirical work undertaken in India. Sericulture is an important means for generating employment, income enhancement crop enterprises, and is a most appropriate household activity. In all these activities, women have shown their mettle and performed their tasks most skillfully. In the village under study, women are playing an important role in silk rearing and processing activities. This article will endeavor to show how “sericulture,” an agro-based activity, has brought about overall development of individual households, the village, and the community at large.

**Keywords:** women, sericulture, community development, division of labor.

### ROLE OF KVKS IN AGRICULTURAL EXTENSION

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The Krishi Vigyan Kendras (KVK) in the country was established in 1974 with the first one at Pondicherry subsequent to the detailed discussions and studies followed by the recommendation of the Education Commission (1964-66), Govt. of India. Krishi Vigyan Kendras (Agricultural Science Centres) were established as innovative institutions for imparting vocational training to the practicing farmers, school dropouts and field level extension functionaries. The mandates of KVKs are: (1) Organizing frontline demonstrations (FLD) to establish production potential of various crops and enterprises on the farmers fields, (2) Conducting on-farm testing (OFT) to identify the location specificity of agricultural technologies under various farming systems, (3) Organizing need based training of farmers to update their knowledge and skills in modern agricultural technologies related to technology assessment, refinement and demonstration, and training of extension personnel to orient them in the frontier areas of technology development, (4) Creating awareness about improved technologies to larger masses through appropriate extension programmes, (5) Production and supply of good quality seeds and planting materials, livestock, poultry and fisheries breeds and products and various bio-products to the farming community and (6) work as resource and knowledge centre of agricultural technology for supporting initiatives of public, private and voluntary sector for improving the agricultural economy of the district. Therefore, KVK plays a significant role in Agricultural Extension for dissemination and change of Knowledge, Skill and attitude among farmers.

**Keywords:** KVK, Extension and skill.

### DYE SENSITIZED SOLAR CELLS BASED ON NATURAL DYES AS SENSITIZERS: A REVIEW

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Since their development in 1991, dye sensitized solar cells (DSSCs) also known as Gratzel cells after the name of their inventor, have attracted huge attention in the field of renewable technologies due to their ease of fabrication, environment friendliness as well as lower production costs. The key components of a typical DSSC device are a nanocrystalline porous semiconductor photoanode film on surface of which a photosensitizer dye is adsorbed, a counter electrode typically made up of platinum, and a redox coupled electrolyte generally composed of iodide and tri-iodide ions. The sensitizer dye in DSSCs plays an important role of photon absorption and it is heart of DSSCs operation. Traditionally, ruthenium (Ru) metal based complexes as well as organic dyes have employed as sensitizers in highly efficient DSSCs but these are suffering from very high production prices. Recently, natural dye sensitizers extracted from natural resources such as flowers, fruits, vegetables, leaves etc. are the major research interests for researchers as these dyes can be extracted by very simple methods and have non-toxic behaviors. However, the efficiency values obtained from the natural dye based DSSCs are lower as compared to...
the traditional sensitizers but optimization of the cell components that matches well with such dyes can boost the commercialization process for low-cost DSSCs. This review focuses on the recent developments in natural dye sensitizers, their extraction methods, their applications in low cost DSSCs, and work done on natural dye sensitizers on past years.

**Keywords:** Natural dye, sensitizers, DSSCs, low-cost, efficiency

**ESTIMATION OF POPULATION VARIANCE USING NON-CONVENTIONAL LOCATION PARAMETERS IN ABSENCE AND PRESENCE OF NON-RESPONSE**

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In survey sampling, the use of auxiliary information at the estimation stage has been discussed by various statisticians in order to improve the efficiency of their formulated estimators for estimating the population mean. Out of many ratio, product and regression methods of estimation are good examples in this context. The present study utilize the auxiliary information through Ratio type estimator, as these are extensively used in sampling theory in order to get precise estimates of the population parameters by taking the advantage of positive (high) correlation between study and auxiliary variable than usual simple mean estimator. In this study we have addressed the issue of estimation of population variance utilizing non-conventional location parameters and some of their functions of an auxiliary variable in absence and presence of non-response. A class of ratio type estimators have been suggested with their mean square error (MSE) in simple random sampling. The suggested estimators have been compared with the estimators given by Isaki (1983), Singh (1999), Kadilar and Cingi (2006a), Kadilar and Cingi (2006b), Solanki et al. (2015) and Singh and Kumar (2015). Further, an empirical illustration is carried out to support the theoretical findings.

**Keywords:** Non-response, Simple random sampling, Non-Conventional Location parameters, MSE, Efficiency

**SIZING OF OFR UNDER DIFFERENT CROPPING SITUATIONS USING THE WATER BALANCE MODEL**

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For natural resource management and sustainable development of rainfed farming systems, the optimum size of the rainwater storage and recycling structure is essential for mitigating the uncertainty of rainfall. The on-farm reservoir (OFR) is an auxiliary storage structure in upland rice fields to conserve excess rainwater and also to provide supplemental irrigation for increasing rice production as well as growing a second crop in winter season. But most of the structure is over-designed or under-designed because of inappropriate design procedures. Rice is grown generally in all topo-sequences including uplands during the rainy season. Rainfed upland rice in eastern India suffers from drought due to poor rainwater management practices during the monsoon season. These lands often remain barren in winter due to scanty rainfall and lack of rainwater storage facilities. The lowlands are best suited for rice production because of the adequate water availability and water holding capacity of the soil. For determining the optimum size of the OFR, daily simulation of water balance model in the cropped fields as well as in the OFR was developed to assess the availability of water in the OFR to meet supplemental irrigation demand of rice in monsoon season and pre-sowing irrigation to mustard in winter. This model requires soil, crop and meteorological data as inputs. To overcome this problem, user friendly software was developed using Visual Basic.NET. It simulates various water balance components such as evapotranspiration, seepage and percolation, surface runoff and depth of supplemental irrigation and ponding depth in the field on a daily basis. Seepage and evaporation are two major outflow component of unlined OFR. The software predicts optimal size of the OFR, so as to provide supplemental irrigation to kharif crops in critical growth stages. In rabi crops, supplemental irrigation is provided at pre-sowing and critical stages of crops. The software is able to compute size of the OFR for various cropping pattern i.e. rice, maize, rice-mustard and maize-mustard, etc. User has to specify the crop he wants to grow in the field and the type of irrigation practice he wants to follow. The developed software was validated using one year data (2014) collected from the field experiments conducted at Agricultural and Food Engineering Departmental farm of IIT Kharagpur. The software was tested for rice, maize, rice-mustard, and maize-mustard cropping sequence under different irrigation practices and different field sizes. The OFR size was found to be lower in case of single crop (maize) in comparison to rice-mustard because of higher irrigation requirement.

**Keywords:** Rainfed farming, on-farm Reservoir (OFR), water balance model, supplemental irrigation, cropping pattern.
INCREASING ECONOMY AND FARMER’S INCOME BY CONTROLLING THE EFFECT OF BIOTIC AND ABIOTIC FACTORS ON SHELF LIFE OF KANGRA TEA

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Tea, Camellia sinensis, is one of the oldest and non-alcoholic beverages used in the world. It is available for consumption in six main variants, based on the oxidation/fermentation technique applied during processing. Black and green tea is the most common form of made tea. Basically commonly known but completely ignored problem of tea i.e. the effect of different packaging material (Flipovic. et al., 2009) on the shelf life (Debnath et. al 2012) of the Kangra tea and seasonal impact on tea. This study proves to be quite useful in respect of variety, durability, cost, production and economic status of the tea. As we aware, that tea is used worldwide as a beverage once or thrice a day. Shelf life is the important aspect on the storage of tea because quality and also the large quantity of stored made tea available at home get spoiled due to the non-availability or lesser knowledge about the best packaging material of tea against different seasonal variations and packaging problems (Gimenez et al., 2003). If this problem is solved then it is a better solution for society and also it strengthens the economy of India. The study is planned with objectives viz. 1.To study the impact of different packing material on the shelf life of Kangra Tea. 2. To study the seasonal impact on the shelf life of Kangra tea. and 3.Isolation and identification of different biotic factor responsible for the degradation of packed tea. Research work will be carried out through site selection, sample collection, from Palampur tea cooperative factory at three different growing seasons of tea in a different type of packaging materials. Various microbial parameters shall be tested in the laboratory of Crop Research laboratory of Agronomy department of CSKHPKV, Palampur and Natural Product Laboratory of IHBT CSIR Palampur of Kangra district (H.P.).

SOIL HEALTH CARD SCHEME

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Sustaining agricultural productivity depends on quality and availability of natural resources like soil, water, etc. Intensive agriculture with growth in food grain production, use of varieties of seeds, usage of fertilizers with the existing Nitrogen, Phosphorus & Potassium consumption ratio is skewed from 8:2:3 (2012-13) as against preferred ratio of 4:2:1. Fertilizer recommendations rarely matches soil fertility need, and usage of fertilizers differs from place to place. Soil health card scheme is one of the flag programmes of Government of India that was launched in February 2015. Schemes managed by Integrated Management (INM) Division in the Ministry of Agriculture Cooperation and Farmers’ Welfare (AC&FW), Government of India (GoI). This scheme was launched to help farmers to know their soil health condition as represented by 12 important soil parameters (viz. Nitrogen, Phosphorus, Potassium, pH, EC, Organic Carbon, Sulphur, Zinc, Boron, Iron, Manganese and Copper) and follow management practices accordingly. Under this scheme, soil samples collected from different locations are analyzed in the Soil Testing Labs (STL) as per the norms provided in the scheme’s operational guidelines. The results are uploaded in the national Soil Health Card portal which has been developed for registration of soil samples, recording test results of soil samples and generation of Soil Health Cards (SHCs) along with fertilizer recommendations besides an information module for monitoring progress. To issue Soil Health Cards (SHCs) to all 14 Crore holdings in the country about 2.53 Crore samples are to be analyzed. The cycle is proposed to be implemented in two years, with a target of 1 Crore samples for the year 2015-16 and 1.53 Crore samples in the year 2016-17. The soil health card will contain an advisory based on the soil nutrient status of a farmer’s holding. It will show recommendations on dosage of different nutrients needed. Further, it will advise the farmer on the fertilizers and their quantities he should apply, and also the soil amendments that he should undertake, so as to realize optimal yields.

APPLICATIONS OF INFRARED RADIATION IN FOOD PROCESSING: A REVIEW

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Wave concept of electromagnetics is the most important and classic concept defining the radiation patterns observed in our day to day life. With rapid technological advancements, this concept has been exploited in a wide scientific domain for the...
betterment of human life. The various bands of EM spectrum have been used for different purposes in food processing sector. Infrared radiation is one of the most important bands of the electromagnetic spectrum having a wide domain application in food processing at the commercial level. The applications can be broadly divided into two group’s viz. transformation of foods, quality evaluation, and disinfection. Among the transformation processes, drying is the most prominent, potential and experimented application. The other processes in the food transformation include blanching, peeling, roasting etc. most of which are being experimented on pilot or laboratory scale basis, and are giving promising results in terms of product quality, processing times and economics. Non-destructive quality evaluation of foods is one of the commercialized applications of IR radiation, which is specifically put under the name of Infrared spectroscopy, comprising of Near-infrared spectroscopy (NIR), Mid-infrared spectroscopy (MIR) and Far infrared spectroscopy (FIR). Surface disinfection of foods using infrared radiation is its recent application. Infrared radiation for drying has also been used in combined modes, in conjunction with convective drying and microwave heating, both of which have proved to be significant. All the aforementioned facts light up the more potential uses of infrared radiation in food processing.

Keywords: Infrared, Drying, Spectroscopy, Disinfection

EXPLOITATION OF UNDER-UTILIZED FIBRES FOR EARTH'S RESTORATION AND INCOME GENERATION
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The endowed creativity and innovative deeds of humans for the development of their society and their concern for the sustainable development and ecological conservation has diverted attention towards agricultural by- products. The by-product or waste from agro industries has found a potential place outside their respective field owing to their incredible properties. The region of Kumaon endowed with indigenous flora rich in natural fibres due to favorable climatic conditions. These plants are used by local masses for manufacturing household items. Considering the opportunities of natural by-product, a green manure, *dhaincha “Sesbania aculeata”* plant could offer an opportunity to produce textiles for technical end use. Besides its primary use, the plant can be taken up additional as a source of income generation among the local people. The researches on *dhaincha* have indicated the existence of splendid properties. Hence the study was planned with the objective to extract fibres for the development of nonwoven for agro textiles uses. The fibres were extracted from bark of 3 months old plant using 15 days stagnant water retting method. The fibres were processed with the combination of sodium carbonate and sodium hydroxide to remove noncellulosic vegetative matter and further softened with silicon softener. The processed fibres were suitable for the development of nonwoven for technical end uses. The extracted fibres exhibited properties like 5.43 g/denier tenacity, 3.41 % elongation, 35.3 denier fineness, 8.12% moisture content. The processed fibres exhibited better properties than extracted fibres and further used to develop nonwoven to use in agriculture as mulch material. The results showed effective moisture control through *dhaincha* nonwoven material in comparison to conventional much materials. Thus the use of plant grown for green manuring can be diversified for technical textile sectors and can lead to the economical and social development of a region and the country.

ROLE OF HOME SCIENCE IN INCREASING LIVELIHOOD AND ACCELERATING DEVELOPMENT IN RURAL AREAS
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Home science is an amalgamation of five dynamic departments, which in the very root of it have rural transformation as their basic component. All department have specific role to play and are very thoughtfully included in the course curriculum of home science. In recent trends it has gain more momentum because of the requirement to home scientists in particularly dealing with the farm women because no other stream offers that. The present paper is an attempt to pursue the changes home science has brought to the rural masses particularly farm women and added to the earning of family eventually ensuring the well-being of family. Paper provides facts and figures from secondary sources of data about its inception and the core values of the subject. It ends up with throwing lights on the avenues it can create in association with other allied agricultural sciences. Through Home Science Extension activities, rural women will have opportunities to discuss their problems and seek solutions to their problems. They will be helped to utilize, to the best of advantage, the products of their labour in agricultural production through improving their nutritional status, health and standards of living. This can provide integrated technical advice to farmers in all aspects of agriculture with emphasising that time utilization pattern of farm women, inter-gender work load, training need assessment and training course development for specific clientele groups needs to be developed.

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IMPACT AND CONSTRAINTS OF TOILET SCHEME FOR RURAL WOMEN’S SECURITY IN INDIA

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Toilets are an important element of a sustainable system. Diseases, including cholera, which still affects some 3 million people each year, can be largely prevented when effective sanitation and water treatment prevents fecal matter from contaminating waterways, groundwater and drinking water supplies. Infected water supplies can be treated to make the water safe for consumption and use. Women’s safety is a key driver behind the big push for sanitation in these villages, led by an Indian NGO called Discipleship Centre. We’re here as Toilet Twinning, a partnership between development agencies Cord and Tear fund to raise money for sanitation projects. As in most poor, rural areas in India, open defecation is still the norm. But while men squat by the roadside in the early morning sun, culture dictates that women have to rise before dawn or wait until dark to relieve them. Prime Minister Narendra Modi’s government has set itself huge challenge: to end open defecation by 2019. Yet people in Shoehorn feel they share of the government radar, the government offers grants to help poor families install a toilet, but the funding has to be applied for retrospectively, with no guarantee the application will succeed. Many people can’t afford to take that risk. Toilets are unmanned toilets which work on a sensor-based technology. The self-cleaning and water conservation mechanism in the toilet makes it unique. The user has to insert a coin to open the door and its sensor-based light system is automatically turned on once you enter the toilet.

Keywords: Sanitation, Toilet, women, safety.

ROLE OF WOMEN IN ENVIRONMENTAL SECURITY IN INDIA

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Health and Hygiene security in more women involve in the water supply and sanitation, however they have lack of knowledge and control to support the hygiene needed for health. Most men hygiene and control the resources and decision making and gender differences is rottenly missing on the consideration with regard to hygiene and sanitation initiatives. Women play an essential role in the management of natural resources, including soil, water, forests and energy and often have a profound traditional and contemporary knowledge of the natural world around them. Women were previously neglected or ignored. There was increasing attention paid to the impact of women on the natural environment and, results in positive effect of environment on the health and well-being of women. The gender-environment relations have valuable ramifications in regard to the understanding of nature between men and women, the management and distribution of resources including responsibilities, the day-to-day life and wellbeing of people. In terms of the environment, women around the world play distinct roles: in managing plants and animals in forests, dry lands, wetlands and agriculture; in collecting water, fuel and fodder for domestic use and income generation; and in overseeing land and water resources. By so doing, they contribute time, energy, skills and personal vision to family and community development. Women's extensive experience makes them an invaluable source of knowledge and expertise on environmental management and appropriate actions.

Keywords: health, hygiene, security, women, environmental.

SUSTAINABLE IMPACT OF SWACHH BHARAT ABHIYAN IN INDIAN SOCIETY

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The Honorable Prime Minister Sri Narendra Modi announced the making of “Swachh Bharat “ (Clean India) into a mass movement and linking it to economic activity to ensure greater participation, Mission Swachh Bharat has been launched. This programme launched on October 2, with Mahatma Gandhi as the inspiration, to create a clean India of his dreams by 2019, his 150th birth anniversary. The Prime Minister has said that the pursuit of cleanliness can be an economic activity, contributing to Gross Domestic Product growth, reduction in health care costs, and a source of employment. Linking Cleanliness to tourism and global interest in India, the Prime Minister has said world class levels of hygiene and cleanliness are required in India’s top 50 tourist destinations, to bring about a paradigm shift in the country’s global perception. August must be acknowledged, appreciated and adopted by every citizen of the country as an actor in the making of the nation. However, it must be noted that the ‘Clean India’. However, it must be noted that the ‘Clean India’ campaign should not be a rechristened version of the similar such campaigns like total Sanitation Campaign or Nirmal Bharat Abhiyan which aimed at Universalizing safe sanitation. In this context, the present article endeavors to briefly review the significant efforts and initiatives for clean India in the recent past and the lessons that could be taken for making ‘Clean India’ campaign a reality. This inter alia means that even in 21st century our rural masses are compelled to either open defecation practice or to the
unhygienic toilets and even the dry latrines. Swachh Bharat mission is very necessary to run continuously in India to really get the feeling of physical, mental, social and intellectual wellbeing. It is to make living status advance in India in real means which can be started by bringing all over cleanliness. Below I have mentioned some points proving the urgent need of Swachh Abhiyan in India.

Keyword: Swachh Bharat, Mission, Clean India,

MEDICINAL AND AROMATIC CROPS: POTENTIAL SOURCE FOR ENHANCING FARMER'S INCOME IN INDIA

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Medicinal plants are plants that provide people with medicines - to prevent disease, maintain health or cure ailments. India has about 2,000 species of medicinal plants and a vast geographical area with high production potential and varied agro-climatic conditions. Medicinal herbs are considered as valuable and profitable cash crops. The herbs have a good export potential also. Growing, processing and selling medicinal herbs have better opportunities for the farmers. Indian Govt. has formed Central Herbal Agro Marketing Federation of India to provide the marketing facility to the herbs growers. Any individual having sufficient land and irrigation source can start herbs business in India. From the commercial point of view, it is important to have a prior feasibility report of the particular herbs that we are planning to grow. The medicinal plants contribute to cater 80 per cent of the raw material used in the preparation of drugs. Many valuable drugs (e.g. atropine, ephedrine, tubocurarine, digoxin, reserpine) came into use through the scientific study of indigenous remedies. A number of medicinal plants (Ghrit kumara, kalmegh, Artemesia, sataver, Neem, brahmi) produce essential oils used for perfumery e.g. Ajwain, cedar wood, celery seed, citronella, eucalyptus, lemon grass, mentha, spearmints, Palmarosa, patchouli, turpentine and votive etc. Exploiting the benefits of global markets for Indian medicinal and aromatic plants, there is an urgent need to focus attention on Indian traditional systems of medicine and through scientific approaches makes them widely acceptable at national and international levels.

Keywords: Medicinal herbs, Aromatic crops, Cash crops, Drugs.

ACCEPTABILITY OF FIBRE RICH COOKIES DEVELOPED FROM POMEGRANATE PEEL FLOUR

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To develop value added Cookies by incorporating pomegranate peel flour. To determine organoleptic and nutritional attributes of prepared cookies. Methods:- Sensory evaluation of pomegranate peel flour cookies was done by panel of five judges. Products were scored with help of “Nine point hedonic scale” score card especially prepared for the purpose. Results:- On basis of findings it was observed that average sensory scores of different parameters in control and treated sample of pomegranate peel cookies indicates that treatments T2 (8.7) had highest score followed by T1 (8.2), T0 (7.3) and T3 (6.3) making it obvious that an increase in amount of Pomegranate peel powder also increase Overall acceptability of Cookies gradually. At 10% of Pomegranate peel flour incorporation overall acceptability was maximum but it slightly decreased when level of incorporation was increased to 15%. Conclusion:- Fruit peel is generally discarded in majority of fruits juice corners. Even when it is safe for consumption. Peel is recognized as essential components of diet as it contains vital nutrients which play important role in well being. Pomegranate peel is rich source of flavonoids which is powerful antioxidant and protect cells from cancer-causing free radicals. Pomegranate peel can be incorporated in cookies to enhance its fiber content. These can be recommended to the people suffering from GI disorders and constipation.

Keywords:- Pomegranate peel flour, cookies

PERFORMANCE OF FARMER PRODUCER ORGANATIONS (FPOS) IN ANDHRA PRADESH

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The Indian agrarian condition becoming worsen as day by day, due to distortion of marketing ,their produced goods and avoid middle men , to get minimum cost of the product by the farmers . Small Farmers’ Agribusiness Consortium (SFAC) is
providing support for promotion of FPOs. The main aim of FPO is to ensure better income for the producers through an organization of their own. Small producers do not have the volume individually (both inputs and produce) to get the benefit of economies of scale. Besides, in agricultural marketing, there is a long chain of intermediaries who very often work non-transparently leading to the situation where the producer receives only a small part of the value that the ultimate consumer pays. Through aggregation, the primary producers can avail the benefit of economies of scale. They will also have better bargaining power vis-à-vis the bulk buyers of produce and bulk suppliers of inputs. The ownership of the PO is with its members. It is an organization of the producers, by the producers and for the producers. In India total numbers of FPOs are 769. The highest number (141) of FPOs are in Madhya Pradesh and the lowest number (1) in Mizoram. In case of Andhra Pradesh having seven FPOs, out of two are performed well namely Sri Ramanjaneya Farmer Producer Company Limited and Simhadri Farmer Producer Company Limited which are located at Vijayanagaram. Maize and Paddy are the major commodities traded, with an annual turnover of Rs. 7 lakhs and Rs. 2.20 lakhs respectively. The FPOs are given pathway for boosting the economic conditions of small and marginal farmers. Need to strengthen Indian agricultural marketing conditions by extension and execution of FPOs, this leads to betterment of farming community in India.

Keywords: Producers, Performance, Marketing

ECONOMIC ANALYSIS OF PRODUCTION AND MARKETING OF AGRI-ENTERPRISES
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Economics analysis refers to the ability of a farm to lower costs of production by increasing production. Agriculture production displays an L-shaped average cost curve where costs are lower initially but reach a point where no further gains are achieved. Spreading fixed costs, bulk purchases, and marketing power are cited as reasons for economies of size. Labour-reducing technologies may be the primary reason. Most studies do not include the external costs from prophylactic antibiotic use, impact on rural communities, and environmental damage associated with large-scale production. These can contribute to the economies of size. Agribusiness is defined as all business enterprises or sells to farmers / traders / consumers. The transaction may involve either an input or a produce or service and encompasses items such as: - Productive resources (feed, seed, fertilizer, equipment, energy, pesticides, machinery, etc.), Agricultural commodities – (raw and processed commodities of food and fiber), Facilitative services (credit, insurance, marketing, storage, processing, transportation, packing, distribution, consultancy, soil testing etc.). This study aims to identify the income level required for agricultural enterprises to achieve economic sustainability. The theory behind the equation used to calculate a sustainable income is explained. The ecological, technical, social and economic components of sustainability in agricultural enterprises have been identified and discussed and the importance of economic sustainability in terms of achieving total sustainability has been emphasised. Economic sustainability was divided into three rating the income needed to meet the cost of living and to address depreciation and interest costs for the enterprise. Those enterprises that achieved this income level were determined to be economically sustainable.

NATURAL RESOURCES AND EDUCATION FOR SUSTAINABLE DEVELOPMENT
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People depend on natural resources for their survival. The Earth’s ecological cycle cleans the air we breathe, recycles and purifies the water we drink, provides us with food and fuel. The diversity of natural resource also provides enormous economic and community benefits through the use of biological resources in forestry, farming, fishing, recreation and other activities. However, the dimensions of our current resource use are to have access to their fair share of scarce resources are endangered. Thus, sustainable development that dimension of natural resource is important. Sustainable Development is “ability to make development sustainable – to ensure that it meets the needs of the present without compromising the ability of future generations to meet their own needs”. One of the most effective ways of ensuring we appreciate the importance of sustainable development is through the environmental education process. The aim of this study is to examine environment and sustainable development concept on the world and environmental education for sustainable development is to provide for sustainability. Key words: Natural Resource & Environmental Education for Sustainable Development

FARM MECHANIZATION AND POST HARVEST TECHNOLOGIES AND THEIR MANAGEMENT
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Venue : Sardar Patel Auditorium, Swami Vivekanand Subharti University, Meerut (U.P.) India 20-22 October, 2018
Farm mechanization is the application of engineering and technology in agricultural operations, to do a job in a better way to improve productivity. This includes development application and management of all mechanical aids for field production, water control, material handling, storing and processing. Mechanical aids include hand tools, animal drawn equipment, power tillers, tractors, engines, electric motors, processing and hauling equipment. Post harvest loss reduction technology encompasses the usage of optimum harvest factors, reduction of losses in handling, packaging, transportation and storage with modern infrastructure machinery, processing into a wide variety of products, home scale preservation with low cost technology. Use of thermal processing, low temperature, drying, chemical and biological reactions coupled with other preservation techniques are applied to enhance the storability. Containers and packaging materials confer portability as well as extend the shelf-life. Adoption of these techniques could make available a large quantity of food by avoiding losses and provide better quality food and nutrition, more raw materials for processing, thus ensuring better returns to the farmers. Importance of Post-harvest technology lies in the fact that it has the capability to meet food requirement of growing population by eliminating losses making more nutritive food items from raw commodities by proper processing and fortification. Post Harvest Management Practices there are following as - Harvesting-Produce must be harvested without any form of damage and under certain conditions in order to maintain its good quality and prevent spoilage. Harvesting Methods- The use of proper tools will prevent unnecessary injury to the produce being harvested. Field Handling. Grading-The best quality is grade one, those with defects is placed in the grade two and the poorest quality placed in grade three. Packaging-for protect the produce against rough handling during loading and unloading and transport. Storage -Make sure that the containers and the storage rooms are clean to prevent contamination and spoilage of the produce. Transport- During transportation, the produce must be protected against sun, rain and dust by covering it with a light colored tarpaulin or enclosing it in a refrigerators truce.

AGRICULTURAL MARKETING, ENTERPRENEURSHIPS DEVELOPMENT AND IMPORT-EXPORT OF AGRICULTURAL COMMODITIES

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Agricultural marketing is inferred to cover the services involved in moving an agricultural product from the farm to the consumer. It is also the planning, organizing, directing and handling of agricultural produce in such a way as to satisfy the farmer, producer and the consumer. Numerous interconnected activities are involved in doing this, such as planning production, growing and harvesting, grading, packing and packaging, transport, storage, agro and food processing, distribution, advertising and sale. Effectively, the term encompasses the entire range of supply chain operations. However, its key function is to help direct these services, by providing competent and able market information, there by linking the other operations into an integrated service with targeted outcomes. A class of entrepreneurs is must for the economic and industrial development of country. To some extent entrepreneurs are born but not totally. Those who have decided to become entrepreneurs must have basic understanding, visionary power, sense of value, risk-taking capacity, innovative nature etc. as basic qualities. But now-a-days one can be developed as per his/her requirement. They can be motivated and developed to undertake the entrepreneurial activities. Someone has rightly said that, "Self-development is the best development". There are so many means, facilities, supportive institutions, tools, etc. that can be used to motivate and develop entrepreneurs. India since ages has been known to be an agrarian country as nearly 60% of its population is dependent on agriculture for living. During the mid-1960s, India suffered a shortage of agricultural products that later on led to the green revolution that revolutionized the agricultural sector. India not only was able to fulfill the demands of countrymen but it also exported many agricultural goods for profits to other countries. In the present time as well, India’s agricultural export amounts to $33.87 billion as of 2017. This amounts to 10.5% of total export that Indian does.

IMPACT OF WOMEN'S EDUCATION ON THE GROWTH OF AGRICULTURAL BASED SMALL SCALE INDUSTRIES

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The livelihoods of a larger part of India’s population depend on agriculture. Agricultural based business directly influence the country's notional and international economic growth. In past few years many government policies had appreciated the development of agricultural enterprises from small to large scale. This had led to the emergence of many successful small to
Women are considered to play a critical role in the dynamic process of social change. More specifically, rural women engaged in agriculture and allied activities have been realized as the backbone of rural economy of the nation. Any development effort in this direction requires sensitivity and understanding of women’s preferred style of communication, interaction and leadership. In context of Uttarakhand, most effective and leading workforce is of women, visible in every walk of life, from agriculture to small industry. But due to certain specificities like inaccessibility, fragility, marginality, diversity or heterogeneity, as described by Jodha (1992), life in general is tougher for Himalayan women. In spite of their central role in agricultural, they face numerous constraints and challenges in accessing support services, especially extension services that are offered by the state or private organizations (Karuna, 2013). However, over time the top-down approaches has been switched to target-based, group oriented, and participatory approaches. Thus, the focus of any developmental strategy has shifted to women as informal leaders. The influence of opinion leaders on their fellow farmers in the adoption of new technologies has being underestimated in many farming communities in developing countries (Williams, 2005). For effective dissemination of generated information and technology, the combined effort of extension personnel along with the opinion leaders is a vital/critical component of any effective developmental strategy. The paper identifies informal leaders among women farmers in two villages of Uttarakhand state who can be trained and suitably utilized to empower women.

KEYWORDS: Environment, ethics, ANOVA, gender etc.

STUDY ON ENVIRONMENTAL ETHICS AMONG THE HIGHER SECONDARY STUDENTS
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The definition of environmental ethics rests on the principle that there is an ethical relationship between human beings and the natural environment. Human beings are a part of the environment and so are the other living beings. Concept of environmental ethics brings out the fact that all the life forms on Earth have the right to live. Environmental ethics has given a new dimension to the conservation of natural resources concern of mankind to take part in an environmental organisation or voluntarily involve in various instrumental activities is known as participation in the environmental activities. The aim of the present investigation was to study the environmental ethics among higher secondary students. The study was conducted to purposive random sampling of 200 higher secondary students were selected from different school of Faizabad district. The investigators employed the gender, locality of institution, type of institution, medium of instruction, residence of students and type of family of higher secondary students. Descriptive study was used to analyze the data on Dr. Hseen Taj scale and environmental ethics was used as a tool to measure the environmental ethics, this scale consists of 45 items with three categories. The maximum score is 135 and minimum possible score is 45. The data obtained was subjected to statistical analyzed using significance of difference of mean was calculated using t-test or ANOVA. The findings of study revealed that there that exists significant difference in the environmental ethics of higher secondary students belonging to locality of institution, residence of student and show do not significant difference belonging to gender, type of institution, medium of institution, and type of family towards environmental ethics of higher secondary students.

Key words: Environment, ethics, ANOVA, gender etc.

OPINION LEADERSHIP AMONG FARM WOMEN: A STRATEGY FOR WOMEN INCLUSION IN DEVELOPMENT
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Venue: Sardar Patel Auditorium, Swami Vivekanand Subharti University, Meerut (U.P.) India 20-22 October, 2018
DAIRY SECTOR GROWTH IN INDIA VIS-À-VIS HARYANA

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Dairying plays an important role in strengthening rural economy of India. It is perceived to be an effective instrument for bringing socio-economic transformation. It contributes more than one-fifth to the agricultural value of output and provides employment to about 21 million people, the majority of whom, are resource-poor. India is the largest producer of milk in the world. The milk revolution (“Operation Flood”), started by National Dairy Development Board (NDDB) in 1970, transformed India from being milk deficient to the largest milk producer surpassing USA in 1988. The program was led by Mr. Verghese Kurien, known as the Father of White Revolution in India. Dairying in India has come a long way, from being written off as a basket case to the largest milk producer in the world, with production crossing 155.5 million tonnes in 2015-16. Milk production has increased tremendously despite the fact that 70 per cent of its producers are small landholders and landless households. Since 1970, India's milk production has grown by an average of nearly 4% per year and in 2006 became the largest milk producing country in the world. At national level, 57 per cent of the milk production consists of buffalo milk and 43 per cent of cow’s milk. The total milk production has increased from 17 million tonnes in 1951-52 to 155.5 million tonnes in 2015-16. The per capita availability of milk has reached a level of 337 grams per day during the year 2015-16, which is more than the world average of 299 grams per day in 2015-16. And Haryana alone contributes 8.4 million tonnes of milk in 2015-16 and second in milk availability after Punjab.

Keywords: Dairying, milk production, million tonnes, grams, economy

ECO-WASTE MANAGEMENT

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Citrus by-product represents a major problem in the field of food industry. It represents more than 1.5 million tons per year of waste. That waste consists of seeds, pulp and peels (albedo and flavedo), which are represent one half of the fruit. Orange contributes approximately 82% of the citrus by-products. Peels are the main by-product of citrus industry which may lead to environmental pollution due to its bad disposal and accumulation. Citrus fruit peel contains carbohydrates, pectin and fiber, that giving it to better functional properties. Thus, citrus fruit residues, which are generally discarded as waste in the environment, can act as potential for antimicrobial finish for fabric. Due to their low cost and easy availability such wastes are capable of offering significant low-cost antimicrobial finish. The utilization of these bioactive rich citrus residues can provide an efficient, inexpensive, and environment friendly platform for the production of novel antimicrobial finish in the fabric which resist the bacteria. This review systematically summarized the potential components present in citrus peel, which generally discarded as waste.

Keywords: Antimicrobial, Citrus Peel, Waste.

KRISHI VIGYAN KENDRA: A POWERFUL TOOL TO TRANSFORM AGRICULTURE

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The Education Commission(1964-1966) recommended that a vigorous effort be made to establish specialized institution to provide vocational education in agriculture and allied fields at the pre and post-matriculate levels to cater the training needs of a large numbers of boys and girls coming from the rural areas the commission, further suggested that such institution be named as ‘Agricultural Polytechnics’. The recommendation of the commission was thoroughly discussed during 1966-72 by the Ministry of education, Ministry of Agriculture, Planning Commission, Indian Council of Agricultural Research(ICAR) and other allied institutions. Finally, the ICAR mooted the idea of establishing Krishi Vigyan Kendras(Agricultural Science Centers) as innovative institutions for imparting vocational training to the practicing farmers, school dropouts and field level extension functionaries. The ICAR standing committee on Agricultural education in its meeting held in August 1973, observe that since the establishment of Krishi Vigyan Kendras(KVKs) was of national importance which would help in accelerating the agricultural production as also in improving the socio-economic conditions of the farming community The ICAR therefore, constituted committee in 1973 headed by Dr. Mohan Singh Mehta of Seva Mandir, Udaipur(Rajasthan) for working out a detailed plan for implementing this scheme. The committee submitted its report in 1974. The first KVK, on a
pilot basis was established in 1974 at Pondicherry under the administrative control of Tamil Nadu, Agricultural University, Coimbatore. The planning the commission approved the proposal the ICAR to establish 18 KVKs during the fifth five year plan. With the growing demands for more such Kendras, the Governing body of the Councils approved 12 more KVKs in 1979 and they were establish in same years from Agricultural Produce Cess fund. Pending clearance sixth five year plans scheme on KVK planning commission, the GB of the Council again approved 14 KVKs in 1981 which were establish during 1982-83 from AP Cess fund. At present, there are 669 KVKs. Out of these 458 are under State Agricultural Universities(SAUs) and Central Agricultural Universities(CAUs), 55 are under ICAR institutes, 100 under NGOs, 35 under State Government, and remaining 21 under other educational institutions. The KVK scheme is 100% financed by Govt. of India and the KVKs are sanctioned to Agricultural Universities, ICAR institutes, related Government Department and Non Government working in Agriculture. Krishi Vigyan Kendras are agricultural extension centers and its affiliated institution at district level provide various types of farm support to agricultural sector. The mandates of KVKs technology assessment and the demonstration for its application and capacity development. Frontline demonstration to establish production potential of technology on the farmers field Capacity development of farmers and extension personal to update their knowledge and skills on modern Agricultural technologies. To work as knowledge and resource central of Agricultural technologies for supporting initiatives of public, private and voluntary sectors in improving the Agricultural economy of the district. Provide farm advisories using ICT and other media means on varied subjects of interest to farmers. In addition KVK would produce qualities technological products(seed, planting material, bio-agents, livestock) and make it available to farmers, organized frontline extension activities, identify and document selected farm innovations and converge with ongoing schemes and programs within the mandate of KVK.

NUTRITION GARDEN AN INTERVENTION AGAINST MALNUTRITION: A CASE STUDY ON NICRA VILLAGE.

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India is the second largest producer of fruits and vegetables, but their consumption is meager among the rural population that leads to malnutrition. Malnutrition is a serious problem which effects the potentials of an individuals. The sustainable solution to this problem lies in the improvement and diversification of household diets by raising kitchen garden. Vegetables are rich source of nutritional bioactive compounds. They are important sources of protective nutrients like vitamins, minerals, antioxidants, folic acid and dietary fibers. The diversified and highly nutritive vegetables are affordable and cost effective solution to hidden hunger. Home gardening contributes to household security also by providing direct access to healthy diet that can be harvested, prepared and fed to family members, often on daily basis with adequate macro and micronutrient at door step. Keeping this view into consideration the present study was taken during 2014-2015, 2015-2016 and 2016-2017 as an intervention programme in NICRA Village Said-Sohal of Kathua district of J&K. In this village 40 families were provided with mini seed kits of seasonal vegetables at backyard of their houses with an objective to investigate the role of kitchen gardens in food supply and nutritional diversity. Results revealed that kitchen garden could not only help in mitigating malnutrition by providing fresh vegetables round the year but also enhanced income indirectly by saving the money, which otherwise incurred in purchasing of vegetables. Moreover these vegetables are chemicals like insecticides and pesticides free. Apart from that in general health and improvement in general health and comparatively less incidence of diseases was reported with annual reduction on family expenses on vegetables.

AN ECONOMIC ANALYSIS OF PRODUCTION & MARKETING OF MUSTARD IN MORENA DISTRICT OF MADHYA PRADESH

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Madhya Pradesh is a leading state of India in terms of area and production of oilseeds and recognized as soya state in the country. It becomes possible only due to the serious efforts made by the scientists and the government resulting into tremendous increase in oilseed production. Amongst different major oilseeds cultivated in Madhya Pradesh the mustard crop stands on second position after soybean with 10.70 per cent acreage (AERC Report 2014). An experiment was conducted
during the year 2015-16, to find out the cost and return of mustard crop in Morena block in Morena district in Madhya Pradesh. For this objective, 50 grower farmers were selected randomly out of 230 mustard grower farmer and classified in different size of farm holdings viz, small, medium, and large. Cost of cultivation & Cost of production were calculated with the help of cost concept including Cost – A1,A2, B1,B2,C1,C2,C3 and calculate B:C Ratio / Input – Output Ratio, gross income and net income etc. On the basis of study area, It was found that in regulated market Rs. 3282, 3282 and 3502.83 per quintal were received by the small, medium and large farmers, respectively when they sell their produce to local village trader and processing mills it was found to be Rs. 3343, 3317 and 3217, 3288 & 3487.67 per quintal were received by the above mentioned categories, respectively. Average distance to sale point was 15 kms. On the basis of analysis of data it can be concluded that the net income of mustard in case of small, medium and large overall categories of the farmers was recorded as Rs. 31497.38/-, 32042.57/-, 27095.56/- and 30211.84/- per hectare, The B:C ratios obtained under mustard cultivation were 2.78, 2.72, 2.34 and 2.61 among above mentioned categories, respectively. The yield of mustard obtained under small, medium, large and overall categories was 14.86, 15.35, 13.51 and 14.57 g/ha and cost of production to obtain a quintal of mustard was recorded as Rs. 1190.76/-, 1211.69/-, 1502.01/- and 1301.49/-, respectively. The cost of cultivation per hectare of mustard was documented as Rs. 17691.32/-, 18599.50/-, 20295.66/- and 18862.16/- respectively among different the categories. 

Keywords – Cost of cultivation, Cost of production, Gross return, Net income, and B: C Ratio

SYNTHETIC STUDY OF GALACTOPYRANOSYL AMINO ALCOHOLS AND THEIR BIOEVALUATION

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Everyone wants to be healthy, but many of us decline to act in healthy ways. The lifestyle of the people affects the environment. Global public health aims at improving health on a population level. Infectious disease like Tuberculosis (TB) caused by Mycobacterium tuberculosis affects about 8 million people worldwide and kills 2 million people annually. Multiple drug resistant (MDR) tuberculosis and its synergy with HIV and mycotic infections particularly due to Candida albicans, Candida sp. and Cryptococcus neoformans in immunocompromised patients have worsened the problem. Cell wall of M. tuberculosis is an ideal and selective target in antitubercular drug development as it protects the bacterium and to a large extent responsible for drug resistance. Galactose and arabinose are predominant in cell wall of mycobacterium. Thus synthesis of carbohydrate based drugs might be more effective in drug discovery area. Ring opening reaction of Epoxide derivative of galactopyranosyl Sugar with various amines in ethanol and in presence of tetrabutyl ammonium bromide (TBAB) as phase transfer catalyst resulted in quantitative yield of some galactopyranosyl amino alcohols compounds at ambient temperature in a shorter duration. Thus use of TBAB not only increases the yield of the product but also saves time and energy both. The secondary amines namely pyrrolidine, piperidine, 4- (6-chloro-2-pyridyl)- piperazine and morpholine on similar reaction with above epoxides would give corresponding galactopyranosylated amino alcohols in quantitative yields. All compounds synthesized would be tested for biological activity.

Keywords: Tuberculosis, sugar, epoxides, amines

ANTIMICROBIAL EFFICACY OF THELYPTERIS DENTATA AND POLYSTICHUM DISCRETUM AGAINST GRAM POSITIVE AND GRAM NEGATIVE BACTERIA CAUSING INFECTIONS IN HUMANS.

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Ferns are a group of about 12000 species commonly known as Cryptogram vascular plants. The present study was carried out to investigate the medicinal potency of selected ferns collected from different locations of Mussoorie and Jammu. Various Plant parts were used such as Rhizome and leaves for the extract preparation. The antimicrobial activity was assessed by Agar well diffusion method and MIC assay. The data obtained was very effective against E.coli, Bacillus subtilis, Pseudomonas aeruginosa, Salmonella typhi, Staphylococcus aureus. Phytochemical analysis was also done to find out the significant compounds responsible for exhibiting potent antimicrobial activity. Tests detected the presence of Flavonoids, Tannins, Saponins etc., which supported the data. On the basis of the data obtained, Thelypteris dentata and Polystichum discretum can be used to treat various afflictions caused by pathogenic bacteria in humans as herbal formulations pose negligible side effects.

Keywords: Thelypteris dentata, Polystichum discretum, MIC, Agar well diffusion method, Flavonoids, tannins, Saponins, Ferns.

EXTENSION STRAIGHTGIES INCLUDING E-INITIATIVES TOWARDS FARMERS PROSPERITY

NEMI CHAND MEENA

72 Venue : Sardar Patel Auditorium, Swami Vivekanand Subharti University, Meerut (U.P.) India 20-22 October, 2018
Extension programmes: So many Extension programs are going on for Farmers prosperity like NMSA, Rainfed Area Development (RAD), Pradhan Mantri Krishi Sinchai Yojana (PMKSY), Adoption of micro irrigation is providing economic benefits to farmers. Micro Irrigation Fund, Agriculture Contingency Plan, Rainfed Area Development Programme (RDP), National Watershed Development Project for Rainfed Areas (NWDPRA). Most of the family farmers in developing countries live rural areas and are in most cases divorced from technology and vital agricultural support services needed to carry out farming activities. Extension and advisory services are relevant to smallholder farmers, who remain the bedrock of the agricultural and food supply chains in developing countries. Providing farmers with (i) timely and relevant information; (ii) access to credit; and (iii) better market prices could go a long way in addressing global poverty and improving agricultural productivity. The aspect of timely and relevant information, especially with the role of Information Communication and Technology to connect farmers with the information they need has received much attention in the last decade. There is a growing body of experience providing lessons on factors required for successful ICT applications in agricultural extension and on how ICT can lead to beneficial behavior change amongst poor farmers. 3 important roles which ICT can play are in enhancing agricultural production, improving market access, and capacity building and empowerment. ICT initiatives are ITCe-chaupaln-Logue, Tara-haat, Akshaya , Gyaan, doot Rural E-seva, Warana Wired Kisan Call Centers, Village Knowledge centers, agmarknet, enam, apps viz. kisan suvidha, pura kriishi, mkisan application, shetkari masik android app, bhuvan hailstorm app, crop insurance mobile app, digital mandi india, mncfc, bhoomi, hp soil testing, intelligent advisory system for farmers, crop info.

Dietary Pattern of Adolescence Girls of Urban, Rural and Slum Areas
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Adolescent may represent a window of opportunity to prepare nutritionally for a healthy adult life. Adolescence is an important stage of growth and development in the lifespan. Unique Nutritional and health needs of the adolescents are also more important because of more requirements for growth spurt and increase in physical activity. It also supports other bodily functions such as growth, maintenance and repair. The objective of the study was to determine the nutritional status of adolescent girls and to study the relationship between the socio-economic statuses of the respondents with dietary habit of adolescent girls in urban, rural and slum areas in Kanpur district. A study was carried out amongst adolescent girls in the age group of 14-18 years. Total 150 adolescent girls were included. The 72.0 per cent, 88.0 per cent and 84.0 per cent girls in urban, rural and slum areas were belonged to 14-16 age groups. Majority of urban girls were educated. The very poor eating habits and lifestyle conditions were found in slum areas. But, its conditions were better in rural than slum. Most of girl’s vegetarian in rural area. Urban girls more nutritional awareness compared were rural and slum areas. The urban girls were more physically better than rural and slum areas. The socio economic conditions of urban area correspondents were better than rural and slum areas. Nutritional status has profound effect on health and food consumption performance of adolescent girls. The health of the adolescent girls is closely related to nutritional status but there are certain other eco-social variables such as literacy, social status and environmental hygiene which have impact on health of the girls.

Keywords: Adolescent girls, dietary pattern, nutritional status

ICT as Effective Tool for Development of Rural India
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India is a nation with 69.8% of total population lives in rural areas. With such large rural population government is required to make concrete efforts for the development of rural areas. Undoubtedly Government of India has made considerable efforts like Digital India campaign initiated in 2015 to reduce the digital divide and ICT has proved to be a tool for its successful implementation. Rural Development is a process which leads to sustainable improvement in quality of life of poor people residing in rural areas. The percentage of rural population in India is decreasing since last two decades but still it accounts for major proportion of total population. This decrease in rural population could be understood as an indication that there is a need to provide better facilities in rural areas. It indicates that more people are migrating to urban areas in past two decades I order to get access to better facilities and services available in cities. In today’s era Information and Communication
TECHNOLOGIES (ICT) has brought remarkable change in the lives of people in every respect also enabling government to deliver better services even at remotest corners of the country. Various ICT applications have been designed specifically for the people residing in rural areas of the country. Ministry of Rural Development (India) has also taken various initiatives at different levels by way of strengthening the ICT infrastructure to provide opportunities, information and easy access of the rural development Schemes to all citizens in rural India. Such developments have facilitated access to innumerable services and information in a very economical manner. Through ICT, several e-governance initiatives have been adopted which have ultimately proved to be a major contributor in rural development.

STUDIES ON LIQUID MANURE BASED DRIP FERTIGATION ON WATER USE, QUALITY AND PRODUCTIVITY OF ONION
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An experiment was conducted to study the effect of liquid manures viz. banana pseudostem sap, liquid sheep manure, liquid sheep manure+ 1 per cent bio-fertilizer and different nitrogen levels on onion crop (Allium cepa) var. Palam lohit. Soil samples were collected from surface (0 - 0.15 m) and sub surface (0.15 - 0.30 m) layers at monthly intervals (NH4 and NO3) and after the harvest of onion (rabi, 2016-17). The results revealed that with the application of liquid sheep manure and 1 per cent bio-fertilizer gave significantly higher yield (30.6 t ha-1) and yield attributing characters as compared to farmer’s practice. Similar trend was observed for quality parameters viz TSS (10.5°Brix) and protein content (1.8%). The treatment liquid sheep manure+ 1 per cent bio-fertilizer resulted in higher nutrient uptake and availability of primary nutrients. Similarly, soil enzymatic activities viz. phosphatase and urease activities were significantly higher in treatment liquid sheep manure+ 1 per cent bio-fertilizer as compared to all other treatments. The inorganic fractions of nitrogen viz. ammonical and nitrate nitrogen increased significantly over all the sampling stages and at harvest at both the soil depths under study with the application of liquid sheep manure in conjunction with 1 per cent bio-fertilizer. Fertigation with liquid sheep manure + 1 per cent bio-fertilizer resulted in higher water use efficiency and B:C ratio was 5.7.

Keywords: bio-fertilizer, TSS, nitrogen levels, enzymatic activities, liquid manures, inorganic fractions of nitrogen and nutrient uptake.

SOIL HEALTH CARD AND ITS IMPORTANCE TO FARMERS
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Soil Health Card (SHC) is a very advantageous Government of India’s scheme promoted by the Department of Agriculture & Co-operation under the Ministry of Agriculture and Farmers’ Welfare. A Soil health card is meant to provide each farmer soil nutrient status of his/her land and advice him/her on the dosage of fertilizers and also the needed soil amendments, which s/he must apply to sustain soil health in the long run. In India, mostly farmer having less than one hectare land and they are not much aware about cropping systems, market requirement, soil nutrient status, soil fertility and productivity status of their soil. The reason behind that is less awareness about the soil testing procedure, Lack of farming information. Soil health card provide details about the fertility status of the field and what corrective measures the farmers can take to improve their crop yield. It provides important information regarding different soil properties of the selected yield and contributes towards the reducing the excess use of chemical fertilizers and reduce the harmful effect on soil and environment. Bilingual distribution help farmer to understand the status of the field report about the nutrient sufficiency/ Deficiency and use.

Key words: Soil health card, Importance, Soil fertility

IMPACT OF KISAN MOBILE ADVISORY (KMA) ON AGRICULTURAL TECHNOLOGY DISSEMINATION
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To study the Impact of Kisan Mobile Advisory (KMA) on agricultural technology dissemination, the secondary sources were explored. Information was also collected by surfing the net.Krishi Vigyan Kendra, Raipur (Bhatapara) started Kisan Mobile Advisory (KMA) service in the year 2015 (October) and selected 200 (Farmers=125, In-service Personnel=50, Input Dealers=25) Mobile holder members for sending the messages of Agricultural aspects in their Mobile by using Bulk Message Service. After sending the messages for 2 years responses from the members were taken in month of October 2015. For the
TRAINING NEEDS OF AN EXTENSION WORKER

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The extension teaching methods is defined as the devices used to create situations in which communication takes place between the extension workers and the farmers. The main functions of extension methods are: (1) To provide communication so that the farmer may see, hear and do the things to be learned; (2) To provide stimulation that causes the desired mental and/or physical action on the part of the farmer; and (3) To take the farmer through one or more steps of the teaching, learning process, viz., attention, interest, desire, conviction, action and satisfaction. According to use, the extension teaching methods are classified into individual contacts (farm and home visits, office calls, personnel letters etc.), group contacts (demonstrations, training, meetings, discussions, tours, etc.,) and mass contacts (leaflets, radio, television, posters etc.). A vast pool of extension workers engaged in the technology dissemination needs their knowledge and skill to be periodically updated so as to keep abreast of latest technology and modes of their dissemination in the fastly changing global and national scenario. The training of agricultural extension workers is an integral part of the overall agricultural production process. It is the duty of agricultural extension agents to reach farmers scattered around the country with useful and practical information for increased agricultural production. In-service training of the extension agents is the call of the time. Through trained agricultural extension agents new agricultural technology can easily and favorably be transferred to clientele. Training should not be conducted at the time of sowing and harvesting time and lectures should be carried out during the training sessions and choose time suitable for agricultural extension workers. Thus, necessary steps should be taken to identify the unfelt needs of the agricultural extension workers and strengthen their knowledge, skills and attitudes required for performing their job efficiently.

MINOR MILLETS FOR FOOD AND NUTRITIONAL SECURITY

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Nutritional insecurity is a major threat to the world’s population that is highly dependent on cereal-based diet, deficient in micronutrients. Micronutrient malnutrition has been considered as a serious challenge, which is commonly known as hidden hunger, as two-thirds of the world’s population is at risk of deficiency in one or more essential micronutrients as they rely on cereal-based foods. Millets can be served as an important food in attaining both food security as well as nutritional security. In recent years, millets have been recognized as important substitutes for major cereal crops to cope up with the world foods storage. Minor millets are the storehouse of many chemical components including nutrients, phyto-chemicals and non-nutritive functional constituents. Hence, an investigation was undertaken with an objective to find the nutritional composition of minor millets in comparison with staple crops. Minor millet such as finger millet, foxtail millet, kodo millet, proso millet, little millet, barnyard millet and staple crops like rice and wheat were selected for the study. The results revealed that minor millets have high nutrient content which includes protein, dietary fibre, minerals such as calcium, iron, zinc and potassium content compared to rice and wheat. Minor millets offer nutritional security and there is a need for promoting millets as they are highly nutritious. Millets hold great potential in contributing substantially to food and nutritional security of the country and they are not only a powerhouse of nutrients but also are climate resilient crops and possess unique nutritional characteristics. Millets can provide nutritional security and act as a shield against nutritional deficiency, especially among children and women.

Keywords: Minor millets, Protein, Dietary fibre

STUDY ON PHYSICAL PROPERTIES OF KODO MILLET (PASPALUM SCORBICULATUM)

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Kodo millet, \((Paspalum scorbiculatum \text{ L.})\) is widely distributed in damp habitats across the tropics and subtropics of the world. It is indigenous cereal crop of India and is grown today in Uttar Pradesh in the north, Kerala and Tamilnadu in the south. It forms the mainstay of the dietary nutritional requirements. Kodo millet is commonly known as ‘kodo’ in Hindi, \textit{varagu} in Tamil and \textit{harka} in Kannada. It is predominately grown in India and West African countries. The physical properties of kodo millet and other grains and seeds, are essential for the design of equipment for handling, harvesting, processing and storing the grain. Physical appearance of the grain is also an important characteristic which determines the consumer acceptability. Hence the present study was undertaken with an objective to find the physical characteristics of kodo millet. The physical characteristics such as thousand seed weight, thousand seed volume, hydration capacity, hydration index, swelling capacity, swelling index, specific gravity and bulk density were studied. The result revealed that thousand seed weight in kodo millet found to be 3.58 g, thousand seed volume 4.40 ml, hydration capacity 0.76 g, hydration index 0.21, swelling capacity 1.90 g, swelling index 0.43, specific gravity 0.64 and bulk density was found to be 0.81 g/ml.

**Keywords:** Kodo millet, Specific gravity, Bulk density.

MUSHROOM FARMING TO ENSURE THE ECONOMIC SECURITY OF THE FARMER

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India is fortunate to have a varied agro climate, abundance of agro wastes, relatively low cost labor and a rich fungal biodiversity. These factors combined make India a potential major producer of temperate, tropical and subtropical mushroom species. The production and consumption of mushrooms is increasing very fast throughout the world, mainly due to greater awareness of their nutritive and medicinal attributes, unique flavor and texture. Mushroom farming today is being practiced in more than 100 countries and the production is increasing at an annual rate of 6-7 per cent. Present world production of mushrooms is around 3.5 million tonnes as per FAO statistics. China alone is reported to grow more than 20 different types of mushroom at commercial scale and mushroom cultivation has become China’s sixth largest industry. In India, mushroom production shot-up from mere 5000 tonnes in 1990 to over 1,20,000 tonnes in 2013. The land resources in the world are limited, but mushroom is indoor crop, grow independent of sunlight and does not require fertile land. Mushroom growing is a highly labor-oriented venture and labor availability is no constraint in the country and two factors, that is, availability of raw materials and labor make mushroom growing economically profitable in India. Indoor cultivation of mushrooms utilizes the vertical space and is regarded as the highest protein producer per unit area and time. Almost 100 times more than the conventional agriculture and animal husbandry. Five to six crops of mushrooms can be raised in a year under suitable condition. Mushroom production enhanced the livelihood security of farmers through generating additional income. In India it may become foremost source of incomes along with other source of income, which ultimately elevates the socio-economic status of farmer.

VALUE ADDITION OF COOKIES WITH THE HELP OF BUCKWHEAT

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Cookies are considered to be a very high protein snack and the best part is that it is very tasty. It contains grain flour, which provide vitamins, minerals, and fiber all of which are nutritional in value. Low gluten and high nutritional value foods are currently in demand. With the changing time the demand of the consumers is also evolved and consumer in now a day is getting aware about the nutrition. Cookies can be easily fortified with low gluten or no gluten or even fat free to produce food products of high quality. Cookies fortified with the buckwheat are rich in nutritional values. The components present in the buckwheat as like rutin a phyttonutrient found in buckwheat helps fight blood pressure. Oligomeric proanthocyanide is found in buckwheat are seen to fight with the cancer. It also contains the sugar of low glycemic index that help to maintain the

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blood sugar and to control insulin spike in the blood. In this experiment, I performed trials in which C2 has shown the best result. This trail was the combination of the 30% buckwheat with the 70% wheat flour. The cookies contain 11.50 g of protein of a good quality, with about 60 g of the carbohydrates in a 100 g sample. Cookies with 30% buckwheat were liked most by the judges in respect of texture, flavour and taste. These cookies offer a great combination of both good nutrition and taste. They are no longer only a snack but can also be used anytime. With high nutritional values, low glycemic carbohydrates, high amount of carbohydrates and low level of gluten, they are certainly a good combination on taste and nutritional quality.

**Keywords**: Phytonutrient, Gluten, Glycemic.

### INNOVATIONS IN FOOD PROCESSING AND PRESERVATION TECHNIQUES

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Food preservation is through common preservation techniques such as salting, drying, canning, smoking and other. Where, the main problem with the thermal processing method is loss of colour, flavor, vitamins and other nutrients in food products. The food industry is currently interested to use some of novel production and processing technologies that may result in economical and improved quality products. Innovation in food technology goes in parallel with consumer demand for healthy food and safer while improving the quality and shelf life. Novel technologies like microwave heating, the new techniques such as high-pressure processing (HPP), innovations to packaging materials (Active packaging techniques extend the possibility of keeping food quality at its best during storage), and use of preservatives (chemical additives) in food has expanded a great deal in recent years, such as natural anti-microbial preservatives and antioxidants). Also, some of the future methods of food preservation are irradiation, although, these methods are currently in use, they are expected to expand and develop further. The development of novel nano-technological tools and other bioactive ingredients will also contribute to the development of value added food products.

**Keyword**: Food preservation, processing technologies, shelf life etc.

### PERFORMANCE AND DETERMINANTS OF MANGO EXPORT FROM INDIA

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The study has examined the growth performance and identified determinants of Mango exports from India during 2006-07 to 2014-15. The compound growth rate, instability index were applied to estimate trend and instability and the project export to different countries. The time series data were used for estimating the determinants of Indian Mango export. The study observed that the Mango contributed substantially to the total horticultural export during study period. The higher growth observed in the value of mango export (8.77%) than the quantity of export (-6.54%) due to phytosanitary barriers in European and American countries during 2006-07 to 2014-15. The growth of unit value of mango export is higher (16.39%). The instability index has been found higher for unit value (21.38%) than the quantity export (15.94%) and value of export (10.16%). The estimated regression model has shown that export price, lagged production, exchange rate and domestic consumption are major determinants for mango export from India. In order to sustain in the international market improvement in the quality and sanitary standards is essential.

**Keywords**: Mango, export, performance, instability index and export determinants

### NUTRIENT STATUS AND THEIR RELATIONSHIP WITH SOIL PROPERTIES AT NARAYANPUR BLOCK, MIRZAPUR DISTRICT OF UTTAR-PRADESH, INDIA.

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Soil quality is one of the important factors controlling yields of the crops. Soil characterization in relation to evaluation of soil fertility status of the soils of an area or region is an important aspect in the context of sustainable agricultural production. Soil physico-chemical parameters are more important that control its quality. The macro nutrients govern the fertility of soils and control the growth and yields of crops. In the present investigation Narayanpur block was selected in the district Mirzapur of Uttar Pradesh and studied the available macronutrient status and their relationship with physico-chemical properties. Mirzapur district have different cropping systems and irrigated by Ganga canal and Tube well tributaries. Seven representative villages were chosen and 10 surface soil (0-15 cm) samples collected from each village and analyzed for physico-chemical properties and available N, P, K, and S status using standard laboratory procedures. Results of the study
indicated that soils of Narayanpur block were medium to high in organic carbon. Out of 75 collected soil samples, 96% were Low in available nitrogen and medium to high in available phosphorus, potassium and Sulphur. Medium to high in soil. The soil of studied area found Iron Out of 75 soil samples 18.66% soil samples found deficient, 40% soil samples were marginal and 41.34% high in iron content. The Mn out of 75 soil samples 1.33% soil samples were found deficient, 0% found in marginal and 98.67% soil samples found High in Manganese content. While Zn out of 75 soil samples 1.34% soil samples were found deficient, 16% soil samples were found marginal and 82.66% found high in Zn content. Out of total 75 soil samples collected from villages’ 0% soil samples were found sufficient, 0% soil samples were found marginal and 100% found high in Cu content.

**Key words:** Macro and micro nutrient, Physico-chemical properties, Correlation, Soil.

**COMPARATIVE ECONOMICS OF REJUVENATED AND NON-REJUVENATED MANGO ORCHARDS IN SOUTH KONKAN REGION (M.S.)**

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An attempt has been made to study the comparative economics of rejuvenated and non-rejuvenated mango orchards in South Konkan region (M.S.), was undertaken with a sample of 80 mango growers selected randomly out of which 40 farmers were among the rejuvenated group and 40 were among non-rejuvenated mango growers. The rejuvenated mango growers were divided in to 2 groups i.e. Group-I (age of rejuvenated orchards 1-4 years) and Group-II (age of rejuvenated orchards more than 4 years). At overall level, input cost incurred for rejuvenated orchards was Rs 36243, while it was Rs 33952 for non-rejuvenated orchards. The average per quintal cost of cultivation was Rs 3051 at overall level in rejuvenated group while it was Rs 4166 in non-rejuvenated group. At overall level in rejuvenated orchards it was observed that ‘Cost-A’, ‘Cost-B’ and ‘Cost-C’ was Rs. 71773, Rs.132214 and Rs. 147854 respectively. In the case of non-rejuvenated group it was Rs. 64663, Rs.113431 and Rs. 135896 respectively. The Benefit Cost Ratio of rejuvenated orchards at overall level was 1.49 while in non-rejuvenated orchards it was 1.16 respectively. The Benefit Cost Ratio of matured rejuvenated orchards (age of orchards 4-8 years) was 1.60.

**Key words:** Mango, economics, rejuvenated and non-rejuvenatedorchard etc.

**KITCHEN WASTE COMPOSTING MODULE FOR PLANT GROWTH**

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Kitchen waste is a nutrient rich organic material containing high level of carbohydrates, lipids, proteins and other organic molecules which can support abundant population of microorganisms (Wang, et.al.2001). Kitchen waste is usually acidic due to the action of acid fermentation bacteria such as lactic acid bacteria. This needs a buffer to be added to make the environment less acidic. In the present study biodecompose buffer (BDB) is prepared to make an attempt for faster decomposition of kitchen waste. This was prepared by mixing 45 kg of cow dung compost, 8 kg of dry leaves mulch and 1 Kg of sand. Daily household plant based kitchen waste like vegetable and fruit peels, used tea leaves, and foods not of use were used for composting. 1 empty wheat flour bag measuring 15” x 12” was taken. 12 small holes were carved, scattering on whole of the bag. Bag was kept under the sun at rooftop and on soil based platform. 1 Kg of household plant based kitchen waste was thrown in the wrapper followed by top dressing of 2 handful of Biodecompose Buffer (BDB). Next day, on the top dressing of the first day, again daily kitchen waste was thrown followed by BDB. This was done daily till the wrapper filled up. Decomposing material was analyzed for moisture, temperature, efficacy of mass loss, pH value and C:N ratio for eight regular days starting after the wrapper filled up. After 8 days, decomposing material was transferred to a vegetable garden rows and brinjal plant was planted. Plant growth was measured in terms of weekly plant’s length, width, no of leaves and weight of the plant before and after. Moisture and temperature were major factors impacting bacterial community. Moisture content was ranged from 60.4 to 55.2%. Moisture under control was helpful to give warmth and oxygen diffusion within the decomposing material. Composting organisms need a continuously supply of oxygen for their metabolic activities. So maximum mass loss was obtained by 4th day which was 6.5 inches. Temperature range of 30 to 35°C within the compost pile was obtained. Cellulase production by cow dung compost was maximum at 30°C (Saraswati Bai, et. al.2012) which resulted the speedy mass loss. pH stabilizes after 4th day between 6.80 to 6.52 which favored for plant growth. C:N ratio of decomposing material was calculated as 30:1 which favored for maximum fertility. Plant obtained maximum growth during 6th week. It had added 100 new leaves. It was increased 8 inches in length and 11.5 inches in width. Total weight of the plant by the end of the 8th week was 1011 gm.
FARMERS’ PERCEPTIONS TOWARDS APPLICATIONS OF MODERN FARMING TOOLS USED IN VEGETABLE PRODUCTION AT SOLAN DISTRICT, HIMACHAL PRADESH-INDIA

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Increase in vegetable productivity has been achieved in several parts of the country mainly by modernizing agriculture. In this context application of modern farming tools play significant role. The concerned study has analyzed the awareness levels of farmers’ towards application of modern farming tools used in vegetable production and study the effect of modern farming tools on farmers’ income. The scientific orientation inclined by farming community that new methods of farming give better results to a farmer than old tools. The key economic motivation that enforced the farming community were that farmer should work towards higher yield and economic profits. The key constraints and problems emerged during the study mainly circumvented around the lack of sufficient incentives provided by the government and the imparting of adequate training for the use of farm tools.

Keywords: Perception, Modern farming tools, Vegetable Production.

DRY FLOWERS: A BOON TO FLORICULTURE INDUSTRY AND ITS FUTURE POTENTIAL

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Floriculture has emerged as a major diversification option in the agri-business in recent years. In the present era of eco-consciousness, use of natural products like dry flowers and heir parts has become the premier choice of the masses in their lifestyles for interior decoration. They can be utilized in the best manner for making decorative floral craft items, greeting cards and covers, wall hangings, floral designs, calendars, floral balls, festive decoration and other creative displays. The industry comprising of dry flowers are basically localized in Tamil Nadu while the other material for drying is collected from West Bengal, Orissa, Madhya Pradesh, Andhra Pradesh, North Eastern States and Bihar. Although demand for dry flowers is increasing at an impressive rate of 8-10%, and therefore there is a great scope for the Indian entrepreneurs. India, with its vast resources, varied products and experience in the field of dried flowers and plants enjoy a distinct advantage even for dry flower industry as a wide range of plant material can be exploited for dry flowers. Flowers and plant pars for dry flower making are usually collected from wild sources and some flower crops Dahlias, marigold, jute flowers, wood roses, wild lilies, helichrysum, lotus pods, poppy seed heads, staticle, globe amaranth etc. But it is sure that promotion of dry flower industry will not only going to help for creation of huge self-employment for unemployed educated youth but it will also increase the national economy by sale of high quality, ever-lasting produce in domestic as well as international markets. Under the new era of start-up India, make in India and FDI (Foreign Direct Investment) in retails, these kinds of models possess high potential for enhancing the income farmers, self-help groups; NGO’s opting for quality and new diverse floral products through dry flower industry.

STATUS OF MARKETING OF VEGETABLE IN INDIA

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India is the second largest producer of fruits and vegetables in the world next only to China. Most of the marketing of vegetables is done in the unorganized sectors and very little quantity is marketed through organized sectors. India produces about 14% of total world’s vegetables from 15% world’s area. From this production of the vegetables nearly 30- 40% were wastage during the supply chain that is reaching of product from producer to consumer. As we know that the vegetable is highly perishable in nature that is, the negative point for the growers of vegetables in the lack of better transportation facilities at right time. In any kind of marketing the most common problem is the presence of middlemen in the marketing channel. Cause of this as the number of middlemen in marketing channel increases, the marketing efficiency of the channel decreases due to increase in the marketing cost and margin. Out of total vegetables production in India, Potato(28.9%), tomato (11.3), onion (10.3%), and brinjal (8.1%) are the four major vegetables grown in the country which contribute about 58.6% of total vegetable production. Total value of vegetable exports from India were accounted for 2706.97 crores, which account for about 2.25% of total agricultural exports and 0.23% of India’s total export. Major importers of Indian vegetables are UAE, Nepal, Sri Lanka, U.K. and Saudi Arabia accounting for about 55% of the total Indian vegetable exports.

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ANALYSIS OF SHEET RESISTANCE VARIATION WITH STOICHEMISTRY OF CADMIUM SULPHIDE THIN FILMS
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Cadmium sulphids thin films are prepared by spray pyrolysis technique. The electrical properties are studied using hall measurement system. The variation of resistance with stoichometry of cadmium sulphide thin films is studied. It is obtained that CdS films with X=0.50 has the least resistance and the subsequent variation in values of X either way, increases the resistance.

Keywords: CdS, Stoichometry, Sheet resistance.

ADOPTION OF GOOD AGRICULTURAL PRACTICES BY MUSHROOM CULTIVATORS IN SOLAN DISTRICT OF HIMACHAL PRADESH, INDIA
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Solan being the mushroom city of India is having many farmers and entrepreneurs opting for mushroom cultivation and now, through transfer of technologies from lab to land new technological interventions and practices like Good Agricultural Practices (GAP) has established its roots in the mushroom cultivation industry of the country. This research study analysed the key objectives including awareness level, factors affecting the adoption and problems and challenges faced by mushroom cultivators while adopting GAP. For this research work, sample size of 60 mushroom cultivators from Solan district of Himachal Pradesh was taken. Research revealed that awareness regarding GAP particularly for mushroom cultivation and associated certification drawn benefits among growers was observed to be very less. Though, the cultivators considered hygienic practices as the significant component of GAP implementation in Mushroom cultivation. Moreover, unregulated market conditions were the focal problem highlighted by the cultivators to be significantly considered under GAP oriented mushroom cultivation. It was suggested that mushroom Cultivators should explore the possibilities of mushroom cultivation as a potential agribusiness on larger scale with advanced practices like GAP and should also apply for the good agricultural practices certificate with the audit authorities of concern.

Keywords: Mushroom cultivation, Good Agricultural Practices, hygienic practices, Agribusiness, agricultural practices.

MUSHROOM CULTIVATION: MONEY SPINNER FOR FARMERS
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Food and Agricultural Organization (FAO) of United Nations has recognized mushroom as food item contributing to the protein nutrition of developing countries like India, where there is a heavy dependence on cereal diet. It contains about 90% moisture and is basically a low caloric food. The significant feature of mushroom is that this nutritious and tasteful food is cultivated entirely from waste products and converts a wide spectrum of agricultural and industrial wastes into a substrate on which the growth of mushroom is supported. There are various types of edible mushroom available worldwide but in India generally four types of mushroom are cultivated-White Button Mushroom, Portobello Mushroom, Dhingri (Oyster) Mushroom and Paddy Straw Mushroom, among all above white button mushroom are grown all over the world and account for 35-45% of the total mushroom production. India has tremendous potential for the growth of mushroom production with production capacity between 2000-3000 tonnes/annum. In India, 50% of mushroom production comes from marginal farmer and small manufacturing units and the remaining mushroom produced by industrial institutions. Farmers are generating additional income by cultivating mushroom, the raw material are locally available and mushrooms houses are built of kaccha bricks, preparing shelves out of sarkandas. Assistance to mushroom farmers is provided by Department of Agriculture under National Horticulture Mission for spawn units, compost preparation and training. Due to lack of information regarding mushroom cultivation more farm advisory service should be provided to the mushroom growers for dissemination of technical know-how at their door step. The economies of scale in mushroom cultivation should be followed.

Keywords: Compost, Mushroom production, Spawn production, Straw, White button

SUSTAINABLE DEVELOPMENT OF PRODUCTS FROM THE AGROTEXTILES USED IN AGRICULTURAL FARMS
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The agrotechnology is the major technological development which has found an irreplaceable use in the agriculture sector. The textile technology has widened its purpose of safeguarding agricultural products by offering various agrotechnological products. The use of textile structures has reduced the traditional practices like pesticide and herbicide application on crops for enhancing the quality and the yield of crops. Agrotechnological have thus found wide application in agricultural practices and its demand is continuously increasing. Govind Ballabh Pant University of Agriculture and Technology, the leading agricultural university of Uttarakhand, have different crops grown for research, instructional and commercial purpose. The farms utilize the agrotechnological materials and produce lumpsum amount of used textile materials. The study was, therefore, planned to develop value added products from the used textile materials and to assess the consumer acceptability of these products. The product development from these materials gave an advantage of sustainable utilization of agrotechnological materials even after their intended use in the agricultural farms. The used materials were recycled through innovative product development which helped to reduce the textile waste generation in the farms. The products developed using the principles of sustainability were lampshade, hanging basket, coasters, doormat and wind chime and gained acceptability from the customers. Further, the sustainable use of the agrotechnological materials would carve a path for revenue generation and provide social and economic benefits. The reuse or recycling of the agrotechnological materials would ultimately help to reduce the solid waste issues in the farms.

Keywords: Agrotechnologies, sustainable products, value addition, recycle, reuse.

BIO- FORTIFICATION TO ADDRESS MALNUTRITION IN INDIA

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Bio-fortification is an emerging new approach to address micronutrient malnutrition based on the fact that is essentially a food problem. Bio-fortification is breeding crops with increased levels of vitamins, minerals or higher protein with healthier crops. It can be performed through genetic engineering or conventional selective breeding. It differs from ordinary fortification as the main emphasis on making plant foods more nutritious when plants are growing rather than having nutrients added to food while they are being processed. Bio-fortification helps directly in improving the micronutrients found on a crop during production and eliminates the need for a public distribution system and no additional nutritional intervention is required for better nutrition for poverty stricken population. Billions of people suffer from micronutrient malnutrition also known as hidden hunger leading to chronic deficiencies and health problems of blindness, anaemia, stunting growth and mental problems, low working capacity learning disabilities and even premature death. Most of Indian diets are based on cereals and other starchy foods lacking sufficient quantities of essential minerals and vitamins like iodine, zinc iron and vitamin A and often suffer from micronutrient malnutrition. In India the focus is on six crops viz. pearl millet (iron), wheat (iron), sorghum (iron), rice (zinc), cowpea (iron) and lentils (iron and zinc). As a part of the agriculture ministry Food Security Mission, ICAR (Indian Council of Agricultural Research) has been developing strains including infusing varieties of rice, cauliflower and vegetables with carotene, pro-vitamin A rich Golden Rice and protein rich potato, pro-vitamin and iron rich banana and pro-vitamin A rich orange cauliflower. Bio-fortified strains of crops like rice, maize, wheat and pearl millet and vegetables developed will be used to study the health parameters over a period of time to curb the problem of malnutrition. Value added food products to be developed so as to improve the status of food and nutritional security for malnourished. Various nutrition education programs needs to be planned to educate the masses on nutritional benefits of these new varieties and encourage farmers to grow and eat these bio-fortified food from traditional staples.

MICRO-ENTREPRENEURSHIP DEVELOPMENT THROUGH FOOD PROCESSING TECHNOLOGIES IN KASHMIR

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Micro-entrepreneur creation through food processing training aims at developing entrepreneurial competence and confidence of potential entrepreneurs dairy cooperatives, vermi-composting, nursery of fruits and vegetables, processing and value addition to horticulture crops, mushroom cultivation, apiculture’s sericulture, fish farming, poultry management have greater potential to empower farm women. Agriculture being an important occupation for the rural people in Jammu & Kashmir region has potential for micro entrepreneurship development through food processing units. The state grows a variety of food crops like rice, maize, wheat pulses, oilseeds and has a monopoly of growing temperate fruits like apple, pear, peach, plum, apricot, cherry, walnut, almond and quince. The Horticulture industry serves as a major economic boost for the development of the
ROLE OF CROP DIVERSIFICATION IN SUSTAINABLE INTENSIFICATION OF AGRICULTURE

Women play a pivotal role in all types of household, farm and allied activities that are deprived from most of the privileges of life. Postharvest losses of horticultural crops are enormous and it is a serious threat for horticulture industry. However, these losses can be avoided to some extent, if the produce is handled with great care after harvest. The properly harvested, graded and packed fruits and vegetables have good market potential, because now-a-days consumers are becoming quality conscious and believe in hygiene and food safety. Food processing technologies provide opportunity to the individuals or group of skilled persons to become successful entrepreneur. Value added agriculture has attracted attention in recent years as a means to increase and stabilize to help them start new ventures. The ICAR and SAUs form a close network for agricultural research and extension education through All India Coordinated Research Projects, National Agriculture Research Project, KVKs, National Agriculture Extension Projects and deeper intervention of the ICAR have provided an umbrella to develop and demonstrate front line technologies to empower farmers in the country. Micro and small industries need to be nurtured and Government support in form of financial assistance for term loan, working capital, machinery and technology upgradation and food testing laboratories is required for safe quality products.

ORGANIC FOOD AND HEALTH

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Organic food is in nowadays. With a lot more people choosing to live the healthy life it’s quite normal to have people making healthier food choices. Most people buy organically grown food products because they are concerned about pesticides, additives, antibiotics or other chemical residues. Organic foods are items that are produced, processed and packaged without using chemicals including items such as vegetables, fruits, milk and meat products etc. As organic food is the result of sustainable agricultural practices the produce is the healthiest in terms of nutrition, taste and fresher, free of unwanted drugs and avoids genetically modified food. Organic is not good just for the people consuming it, it is also good for environment. Though it may be more labour-intensive and use more resources, it uses fewer pesticides, antibiotics and other harmful substances which will give way to a greener earth. Consumer demand has risen at even faster rate for organic foods and it can be attributed to the massive cultural shift towards healthy eating. In last few years more stores have been offering a greater selection and the availability of organic foods.

WOMEN EMPOWERMENT STATUS AND MEASURES FOR MAINSTREAMING SUSTAINABLE QUALITY OF LIFE IN FARM WOMEN OF UTTARAKHAND STATE

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Empowerment is a multidimensional social process which helps people to gain control over the quality of their own lives. Women empowerment enhance women’s power to take control over decisions that shape their lives, and access to resources, participation in decision making and control over distribution of benefits. Women deprived from the right of decision-making in important household affairs, adequate food, proper education and recognition in household and social affairs. Women play a pivotal role in all types of household, farm and allied activities that are deprived from most of the privileges of life. Women work for 14 -18 long hours performing manual works daily on farming operations, livestock raising, fetching fodder, fuel and water from distant places and expanding more total energy a day. Their work is not recognized in any statistical terms. In agricultural sector women participate in several activities such as weeding, sowing, transplanting, harvesting, and storage. For this a systematic procedure is needed to address their problems. This includes selection of descriptive and experimental detailed research design, conceptual framework and schematic representation of interaction of variables. Tools and techniques will be developed for collecting information related to work, health and their safety and improving their skills, enhancing the income and upgrading technical knowledge. Empowering farm women for better quality of life is an important and burning issue today. Knowledge coupled with efficient resource management is considered one of the most important factors for development. Extension approaches and strategies followed for transfer of technologies to farm women are required to satisfy their specific needs and problems. Thus there is a need to be given on cultivation technologies, improved agricultural tools and implements, institutional approach for empowerment and inculcating entrepreneurship skill in them. Coordination is to be made among technology generation, technology dissemination and technology receiving system. In farm women provides valuable information to development authorities to formulate appropriate strategies in framing the policy, organizing suitable extension activities and training programmes for the women. It also helps to formulate proper policies to overcome the difficulties and improved management practices. The study will be designed to focus on the contribution of socio-economic characteristics of farm women towards extent of empowerment. This helps in identifying programmes and methods that enhance the extent of empowerment of farm women.

ROLE OF CROP DIVERSIFICATION IN SUSTAINABLE INTENSIFICATION OF AGRICULTURE
Crop diversification sustains the agricultural production system of any area through protection of environment and maintaining soil health. The desirable change in the existing cropping patterns towards a more balanced cropping system to meet the ever increasing demand for food is bases for crop diversification which is technologically feasible and economically viable. Lack of crop diversification in our cropping system has cause never ending problems that mainly include pollution of the ecosystem, excessive use of water resources (as in case of rice crop) causing poor water use efficiency (WUE), deterioration in soil health, multiplication of diseases, pests and weeds, unplanned consumption of energy, reduction in the availability of other protective food and high value crops.. The main goal of crop diversification is to stabilize farm income and promote better farm linkages among primary, secondary and tertiary sectors of economic activity. The major reasons which highlight to need for adopting diversification are conservation of natural resources, more income to marginal farmers, combat ill-effects of aberrant weather provide employment opportunities, reduce dependence on outside supply, diversify food basket, withstand price fluctuations, promote export possibilities. Crop diversification can be a useful means to increase crop output under different situations. Crop diversification takes into account the economic returns from different crops. This is very different to the concept of multiple cropping in which the cropping in a given piece of land in a given period is taken into account. Therefore, conservation of agriculture and its sustainability can enhance through diversifying crops and cropping system.

CLIMATE CHANGE IN HIMALAYA, YARSHA GUMBA AND ITS IMPACT ON RURAL ECONOMY OF NEPAL.

Nepal ranks 4th under Climate vulnerability index and the high Himalayas is much more vulnerable than lower lying region in Nepal. Several studies report that the Himalayas is warming at the rate of 0.6 °C per decade in the last three decades, which is much higher than the global average of 0.74°C over a hundred year. Impact of climate change has been seen in the livelihood of communities over the Himalayas, of which impact on Yarsha Gumba (Ophiocordyceps sinensis) collecting communities in western Himalayas of Nepal is not an exception. Yarsha Gumba, popularly known as ‘Himalayan Viagra’, is claimed to be the world’s most expensive medicinal fungus, which is used in the treatment of asthma, cancer, and impotence. It is also being used as a supplement to tea, coffees, milk product and energy drinks. Due to the price fetch from a single fungus can be much higher than a day of manual labor, people go for its collection in high altitude leaving the villages deserted and the school closed. In 2011, the value was estimated at about $ 25,416 or NPR 20, 33, 280 (1 US$ = NPR 80) per kilogram. Yarsha gumba has contributed up to 65% of the annual income to the collector. During, the year 2010-14, there was a mean annual decline of 25 pieces in the per capita harvest. Due to the climate change, their availability will be shifting to higher altitude and 36-39% of habitat will be lost in Tibet. This scenario demands a study of the climate change with respect to its population in major Yarsha collection centers in Nepal, and its subsequent socioeconomic impacts on collector, to regulate the collection, market, and trade of it.

Keywords: Yarsha Gumba, Ophiocordyceps sinensis, climate change, Himalaya, socioeconomic impact, livelihood

INTELLECTUAL PROPERTY RIGHTS FOR USE OF GENETIC RESOURCES AND THEIR EFFECT ON LOCAL COMMUNITIES

Intellectual property right is the right given to the creators to have secured limited use for specified period of time for making, using, or selling a new, useful, non-obvious invention. Convention on Biological Diversity (CBD), 1992, defines genetic resources (GRs) as genetic material of plant, animal, microbial or other origin comprising functional units of hereditary that have actual or potential value. Although, GRs are not intellectual property (IP) however inventions based on or developed using GRs are protected through the IP system. In developing countries, the local and indigenous communities have preserved these GRs as traditional knowledge (TK) for generations and now being exploited immensely for modern...
scientific research. Concerns about the misappropriation of the GRs and TK have been addressed by establishment of laws and treaties on an international level which include CBD(1992), Bonn guidelines on access and benefit sharing(2002), International Treaty on Plant Genetic Resources for Food and Agriculture ITPGRFA (2004) and Nagoya protocol (2010) provide legal framework for access and benefit sharing (ABS). However the issue arises in the effective implementation of these policies in sharing the benefits arising out of commercialization of these resources. The issue of biopiracy arises where developed countries have been reproofed with exploiting developing countries’ GRs and their communities’ TK without authorisation or compensation by granting patents on inventions derived from the same. It jeopardizes the communities’ way of living, livelihood and violates the sacred customs which are of immense value to them. These agreements do not define novelty standards and thus do not recognize the oral transfer of TK and the role of these communities in the development of these GRs. However the companies that take GRs from indigenous communities and develop products (e.g. drugs) based on those resources could own patents enabling the company to sell the invention back to its “true inventors”. Keywords: Genetic Material, Jeopardise, Nagoya Protocol, Patents

IMPORTANT PRODUCTS OBTAINED FROM BEEKEEPING

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The seven important products obtained from beekeeping, viz., honey, beewax, honeydew, bee bread, propolis, royal Jelly, bee venom and apiotoxin. Honey is produced by worker honey bees. It contains 17% water, 38% fructose, 31% glucose, 1.3% sucrose and 7% enzymes and other mineral matter. To produce honey, honey bees suck the nectars from the flowers with the help of proboscis and glossa. It is used as a food, medicine, antibiotics and cosmetics etc. Bee wax is secreted by the wax glands located on the underside of the last four abdominal segments (4th to 7th) of the worker bee. This wax is used in constructing bee combs in which the colony of the bee develops. It is also used for making of candles, making pharmaceutical preparation, preparation of varnishes and paints, water proofing and waxing threads, formation of comb foundation and pathological and scientific laboratories for preparation for tissue during micro-anatomical survey of soft tissues. Honey bees collected resinous substance known as propolis from tree bud, sap-flows, tree bark and other botanical sources. It is used as sealant material for unwanted open space in hives. It is also used for filling the cracks, holes and some small gaps. It has some medicinal importance for human, medicines for tonsillitis, bronchitis and dental infections. Royal jelly is secreted by hypopharyngeal and mandibular glands of nurse bees of the age of 6 to 12 days when the glands are fully active. It is the richest nutritious food and is fed to the young queen larva. It contains a high concentration of vitamins B5, B6 and natural glycerides and amino acids and is believed to be a potent antioxidant, a special rejuvenating substance that promotes tissue growth, muscle and cell regeneration. Bee bread is mixture of nectar, pollen grain and honey. It is simple food material and is fed to worker, drone or male bee and its larva so also known as bee bread.

THE LIVESTOCK ROLES IN THE WELLBEING AND UPLIFFTMENT OF SOCIO-ECONOMIC STATUS OF FARMER’S

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The livestock species play very important economic and socio-cultural roles for the wellbeing of rural households, such as food supply, source of income, asset saving, source of employment, soil fertility, livelihoods, transport, agricultural traction, agricultural diversification and sustainable agricultural production. The livestock development in India has assumed a much broader role in the overall economy than so far envisaged. Demand for animal food products in India is also rising owing to population increase, urbanization and sustained rise in per capita income. Animal husbandry has been an integral part of Indian agriculture. It assumes greater significance in India’s socio-economic development. Livestock system is known to enhance sustainable livelihoods for farmers. Livestock farming represents the only way by which the large parts of natural vegetation can be converted into economic products. Livestock products play an important role in export earnings. Livestock sector helps in augmenting farm family income, narrowing down the protein gap, providing draught power and manure for crop cultivation and in earning foreign exchange. Livestock generated more employment for men and women. The households used livestock for mitigating uncertainties of farming. The overall viewer of livestock farming is a symbol of higher social status. The livestock system contributes economically and socially to enhance sustainable livelihoods. The first purpose to keep the livestock is to obtain milk to sell that provides additional source of income to their livelihood. Keywords: Livestock, Food, Socio-economic, Sustainable, Livelihood
A STUDY ON REPAYMENT BEHAVIOUR OF AGRICULTURAL LOAN BORROWERS THROUGH COMMERCIAL BANKS

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Agriculture is one of the predominant pillars of the Indian economy. To meet the requirements of the growing population and rapidly developing economy, agriculture has to grow fast and get modernized. This requires the use of high pay off inputs. Adoption of high yielding varieties requires large quantities of fertilizers, plant-protection chemicals, modernized equipments, and machineries, which in turn needs huge investment. Though agriculture provides employment to about three-fourths of the working population and contributes the major share of the national income, yet, in India, it is more a way of life than a pure business. As Cultivation becomes uneconomic, the cultivator is forced into a hand-to-mouth existence, which, in turn, presses him to borrow either for consumption or for investment in agriculture. Individual tend to use different credit utilization pattern for obtaining the technology. For accepting any innovation by the farmers in varying socio-personal and farm situation, different types of credit utilization pattern are required. Thus by keeping this view the study was conducted in purposively selected Bundi district of Rajasthan. Total of 500 agricultural loan borrowers were formed the sample for the study. The primary data were collected through personal interview method with the help of pre-tested interview schedule, which was prepared on the basis of objectives of investigation and variables. The statistical tests and procedures were used for analyzing the data with the help of statistical tools like- mean, S.D., percentage, and Karl Pearson’s coefficient of correlation, multiple correlation and regression analysis. We found that 67.60 per cent borrowers paid their dues on time and to be called as “Regular” or standard borrowers It was observed that correlation coefficients in respect of sources of information, Cosmo-politeness, scientific orientation and risk preference were found positive and highly significant with repayment behaviour of farmers. Co-efficient of determination value of 0.5514 with highly significant ‘F’ value revealed the significance of regression equation in the prediction of repayment behaviour of farmers. Out of sixteen traits viz., caste, annual income, cosmopolitanity, scientific orientation and Risk preference were found positive and highly significant relationship with repayment behaviour of farmers. Crop raze due to natural hazards as major constraints for effective repayment behaviour by borrowers and curb less financing, effective crop insurance and procedure of loaning should be more sophisticated were the main suggestion offered by borrowers for effective repayment behaviour of the borrowers.

CONSUMERS’ PREFERENC TOWARDS DIFFERENT FRUITS OF WEST BENGAL

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Understanding the preference pattern of consumers is important to set the farmers and researchers to produce and sale fruits according to consumers’ and retailers’ need. In this study four important fruits of West Bengal were selected i.e. Mango, Banana, Guava and Ber. The objectives of this study were to find out the background information of consumers, to study the purchase behaviour of consumers, to find out the attribute importance of consumers towards the selected fruits, to study varietal difference of fruits by the consumers and to identify problems faced by consumers. The study was conducted in the small town of Kanchrapara in North 24 Parganas district of West Bengal, India. Data was collected with the help of questionnaire the study from 30 consumers who were selected from Ward no 14. It was observed that majorly of the consumers were men within the age group of 41-60, while 50% of all the consumers purchased fruits irregularly. The consumers belonging to annual income more than 5 lakhs used to purchase fruits regularly while those of the low income group purchased fruits irregularly. Consumer gave more importance to odour of the fruit in mango and spotlessness in banana whereas in case of guava and ber the 1st preference went to tightness and colour respectively. The preference pattern of different varities of fruits was assessed through semantic differential scale. The decreasing orders of preference were Himsagar, Langra, Fazli and Amrapali for mango, Singapuri and Martaman for banana and Apple ber and Narkeli for ber. Consumers identified presence of spots in the skin of mango and banana, high price for guava and ber as potential problems. It can be concluded that the study on preference pattern opened up newer information which could be utilised for production and promotion of fruit crops in particular and horticulture in general.

SMART VILLAGE – AN APPROACH FOR SUSTAINABLE VILLAGES

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In India majority of the population still lives in villages. The UN’s State of the World Population Report of 2007 estimates that by 2030, nearly 41% of India’s population will reside in some kind of urban area. Mostly people migrate to cities, due to poor living conditions and lack of job opportunities. Rural development has always been an important issue in all discussions

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pertaining to economic development, especially of developing countries, throughout the world. The socio-economic disparities between rural and urban areas are widening and creating tremendous pressure on the social and economic fabric of many developing Asian economies. These factors, among many others, tend to highlight the importance of rural development. With a vision to create smart villages and promote rural development “Sansad Adarsh Gram Yojana” was announced recently by our Honorable Prime Minister of India. In this era of digitalization the model village will leverage the technologies of ICT to enable a Sustainable Smart Village. These include optimizing agricultural growth, putting up of economic and social infrastructure, fair wages, employment, village planning, public health, education and functional literacy, communication, smart governance, safety, clean and green environment etc. A lot of work needs to be done in making the villages clean. There are different aspects of clean village such as: water supply, sanitation, indoor air quality, solid waste management and renewable energy etc.

HORTICULTURE AS A THERAPEUTIC MODALITY IN URBAN CENTERS

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Horticulture in India is commonly perceived as just growing fruits, flowers, vegetables, feed the population and earn livelihood. However, horticulture has much broader concept rather than just feed the world. Plant people relation is not only just of food, clothing, shelter and medicine but also has been a step further by the domain of horticulture therapy. Horticultural therapy is a professionally conducted client-centered treatment modality that utilizes horticulture activities to meet specific therapeutic or rehabilitative goals of its participants. The focus is to maximize social, cognitive, physical and/or psychological functioning and/or to enhance general health and wellness. Although this concept is not new but with the expanding advancement in medical technology, pharmaceuticals and efficiency, however, the concept of horticulture as a therapy lays fallow for some time. As our lifestyle is changing continuously and becoming more technology dependent, which drag us away from the nature, horticulture therapy is again regaining its importance in last 25 year. Today, country’s urban centres are continuously growing and becoming more polluted, populated, overcrowded and stressful due wrong architectural urban planning. In such urban centers horticulture may emerge as therapeutic medium for addressing innate psychological needs and connection with the natural world and offers restoration and respite from mental stress, providing meaningful, purposeful activity along with encouraging human growth that is 76 fundamental and central to each, individual served through disability services, rehabilitation, occupational therapy, divisional & recreation therapy, landscape architecture.

ROLE OF MUSHROOM IN HUMAN HEALTH

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Although the button mushroom (Agaricus bisporus) accounts for slightly over half of total world mushroom production, specialty mushrooms, e.g., shiitake (Lentinula edodes), straw (Volvariella volvacea), oyster (Pleurotus spp.), and enokitake (Flammulina velutipes), are increasing in popularity. These species contain moderate quantities of good quality protein and are good sources of dietary fiber, vitamin C, B vitamins, and minerals. Lipid levels are low, but unsaturated to saturated fatty acid ratios are high (about 2.0 - 4.5:1). Some species (e.g., shiitake) accumulate cadmium and selenium and other heavy metals, and some may contain toxic substances such as the heat labile cardiotoxic proteins volvatoxin in the straw mushroom and flammutoxin in enokitake. One cup of chopped or sliced raw white mushrooms contains: 15 calories, 0 grams of fat, 2.2 grams of protein, 2.3 grams of carbohydrate, including 0.7 grams of fiber and 1.4 grams of sugar. And role of mushroom on human health is Anemia Prevention (source of dietary iron and contain 8.1mg of iron per cup.), Stronger Bones (adequate calcium help prevent joint complications and osteoporosis) Healthy Immune System (The presence of Ergothioneine and selenium as powerful antioxidants in mushrooms protects the body from experiencing oxidative damage.) Healthy Skin and Hair (The Selenium in the mushroom helps improves skin elasticity, which is a major part of anti-aging. Polysaccharide present in mushrooms helps maintain a hydrated and supple skin.) Weight Loss (Mushrooms provide lean protein, which is effective for weight loss purposes; they are rich in fiber and contain no cholesterol or fat), Manage Blood Pressure (contains potassium, which relaxes and calms the nerves and maintains a healthy level of blood flow.), Manage Diabetes (studies that show the enzymes in mushrooms help break down the sugars and starch in food.), Prevent Breast Cancer (Apart from being high in anti-oxidants, mushrooms also contain linoleic acid, which targets the estrogen levels in the body and reduces the risk of breast cancer.).

INNOVATIVE APPROACHES IN APPLIED SCIENCES AND SOCIO-ECONOMIC DEVELOPMENT EXTENSION STRATEGIES INCLUDING E-INITIATIVES TOWARDS FARMERS PROSPERITY

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Despite a wide range of reform initiatives in agricultural extension in India in the past decades, the coverage of, access to, and quality of information provided to marginalized and poor farmers is uneven. This paper aims to ascertain why farmers are not accessing information by e-initiatives and where information gaps exist, despite the variety of extension approaches in India. Using information provision and access as the basis for analysis, the paper reviews some of the major agricultural extension strategies and programmes in India by considering their ability to provide information and facilitate information sharing and use in farming communities. The review gives a broad overview of the current strategies in India. The paper examines the challenges and constraints of each agricultural extension approach as it attempts to provide farmers with access to information that is relevant to their farm enterprises. The review concludes that there is an increasing need to work in partnership and to share knowledge and skills in order to provide locally relevant services that meet the information needs of marginal and smallholder farmers in India.

Keywords: extension, knowledge, information, initiative, approach

LONG-TERM TEMPORAL TREND ANALYSIS OF RAINFALL USING NON-PARAMETRIC TEST: A CASE STUDY IN MAHARASHTRA, INDIA

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This study investigates long-term temporal trend on three different time series including monthly, seasonal and annual rainfall data of 44-years (1974-2014) of Parbhani district, Maharashtra, India. The temporal trend was analyzed using Mann-Kendall (MK) test at 10%, 5% and 1% of significance levels. The true slope of rainfall trend line was obtained using Theil-Sen’s slope (TSS) test. The results of Mann-Kendall test revealed that there is no trend in the monthly, seasonal and annual series except the March, April and July months. In March, April and July months significant positive trend was detected at 10% and 1% significance levels. The slope of trend line in monthly, seasonal and annual rainfall series was found rising (April, July, September, October, pre-monsoon, post-monsoon and annual), falling (June, August and monsoon), zero (January, February, March, May, November, December and winter). The results of this study can be employed in sustainable development and management of water resources for study location.

Keywords: Trend analysis, Mann-Kendall (MK) test, Theil-Sen’s slope (TSS), Parbhani,

MARKET-LED EXTENSION: ROLE OF EXTENSION AGENTS

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India is an agrarian country with 60% of its population depending on agriculture. It remains the principal source of livelihood for more than 58 % of the population and contributes 17.9% in national GDP. Agricultural sustainability can only be achieved when the ends are target from the means. This does not include only safe production in terms of consciousness of future generation needs but building up the capacity of the Agricultural system towards increase in productivity cum profit maximization through the new trend of extension services. Under WTO, the globalization/ liberalization of market demands farmers at all levels to transform themselves from production and selling in the domestic market to producer cum seller in the wider market scene to realize the optimum returns on their investments. The need for market led is of necessity by the paradigm shift of present agriculture scenarios which calls for conversion of the sector into profit oriented business. The transition from Legitimizer-led extension to Market-Led extension is quiet eventful in the country. Market-led-extension is the market ward orientation of agriculture through extension which includes agriculture & economics. Market-led-extension works with various aspects on quality, consumer’s preference, market intelligence, processing, value addition and other marketing information on regular basis. Many initiatives like Rythu bazaar, AGMARKNET, iKisan, Digital Mandi have been started for the farmers to get market information and recently e-NAM was launched by the government to enhance market access by the farmers. But still there are some challenges which need to be faced related to production, market and extension. The role of extension agents is mainly to overcome these problems. However this loss can be minimized by the Market Led extension approach through adequate supply of information by SWOT analysis of the market, establishing market and agro processing linkages, direct marketing, and capacity building in terms of improved production and post-harvest operation such as proper handling, grading, standardizing, value addition, packaging as well as storage and transport system. The extension personnel must have some competency like technical, communication, facilitation and management in the present scenario to
fulfill the need of the farmers as there are many changes in today’s marketing pattern which can help them in making it a profit oriented business.

SOCIO-ECONOMIC ASPECTS OF MENTHOL MINT CULTIVATION IN THE DISTRICTS OF UTTAR PRADESH
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This study was conducted in the Lucknow and other four main Menthol mint grower districts (Barabanki, Sitapur, Hardoi and Unnao) of Uttar Pradesh on socio-economic analysis of Menthol mint cultivation in the year 2016. The purpose of study was to know about socio-economic characteristics of menthol mint growers in this area. In the study, major characters like age group of farmers, level of education, type of family, source of irrigations, annual income and problems associated in mint cultivation were observed. The small farmers of middle age groups were very keen to adopt mint cultivation. This cultivar was also worked out by input costs and output cost at different stages by the conventional/scientific methods. The study has exposed that the major portion of operational cost is shared by hired labour, distillation charges, irrigation and machine/tractor charges. The data shown variables like man labour, machinery, manures and fertilizer and irrigation charges have shown a positive and significant impact on the returns of mentha crop in the study area. The major problems faced by the farmers was high input cost (not easily availability of suckers and its high cost, fluctuated supply of electricity, infrastructural facilities, lack of sufficient cultivation information, low markets cost of the product and costly distillation tank. Majority of menthol mint growers are belonging in joint family systems having more than 6 members in a family. In the districts, bore-well was the main source of irrigation used by the mint growers. The farmers’ net income was recorded of Rs. 30,000-40,000 per annum.

Keywords: Medicinal and aromatic plants, Menthol mint, Mentha arvensis, Cash crop.

CONSTRAINTS OF APICULTURE IN BAGHPAT DISTRICT UTTAR PRADESH
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Beekeeping plays an important role in the sustainable agriculture as it contributes significantly for diversification of agriculture. Beekeeping is an interesting hobby, an ideal agro-based subsidiary enterprise, providing supplementary and sometimes major source of income to the farmers, especially to the small farmers. It is an ideal, eco-friendly and non-land based rural enterprise, which does not tax the farm resources and provide sustainable livelihood to the rural people, including landless and women. Beekeeping production is affected by indiscriminate use of pesticides, bee diseases and enemies, adverse effects of weather, low price of products, etc. The susceptibility of honey bees to different diseases, pesticide hazards and marketing of bee products were found to be major limiting factors in the prospects of beekeeping. Majority of the beekeepers wanted to increase their level of business. Therefore, the specialized training courses should be organized to overcome these problems and promote their business.

Keyword: Apiculture, Allied business, Beekeeping, and Honey production.

AGRI-PRENUERSHIP AS A TOOL TO UPLIFTMENT OF AGRICULTURE
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A shift from agriculture to agribusiness is an essential pathway to revitalize Indian agriculture and to make more attractive and profitable venture. An agripreneur is someone who undertakes a variety of activities in agriculture and its allied sectors to be agripreneur. An agripreneur may start an agro business, change a business direction, acquire a business or may be involved in innovatory activity of value addition. India 2/3rd population is employed in the agriculture sector, providing viable and sustainable business opportunities in Indian agribusiness is essential for generating employment in the country. Innovation, production, financial and marketing was the four step to be an agripreneur. Various challenges/ barriers faced by
the farmers like lack of funds, lack of infrastructure, risk, marketing problems and competition, management problems. To solve these problems measures should be adopted i.e. establishment of finance cells, Concessional rates of interest, suitable supply of raw materials, offering training facilities and setting up marketing co-operatives.

**IMPORATANCE OF BLACK GRAM IN HUMAN LIFE**

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Black gram has been in cultivation from ancient times and is one of the most highly prized pulses of India and Pakistan. It is originated by India. It is very widely used in Punjabi cuisine and is often referred to as maah di daal in the native language by Punjabis. The Coastal Andhra region in Andhra Pradesh is famous for black gram. The Guntur District ranks first in Andhra Pradesh for the production of black gram. Black gram has also been introduced to other tropical areas such as the Caribbean, Fiji, Mauritius, and Africa, mainly by Indian immigrants. Black gram (VIGNA MUNGO L.) belongs to leguminaceae family known as also urd. The Black gram make a importance role in our health like Black gram originated in India, where it has been in cultivation from ancient times and is one of the most highly prized pulses of India and Pakistan. It is very widely used in Punjabi cuisine. Black gram is rich In protein 25.26%, Carbohydrate 59.9%, Fat 1.64%, Cholesterol 0% and Vitamin A -23 IU and many micro nutrients like Zinc, phosphorus, Mg, Fe, etc also found. Black gram is one of the important crops among the pulses crop. In India the area under black gram cultivation is 3.19 Million ha producing 1.95 million tones and contributes 11% of the total production in the our country.

**PRECISION FARMING: THE FUTURE OF INDIAN AGRICULTURE**

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Human kind invented agriculture 10,000 years ago. After a long mile, no where in the world has agriculture made such an impact as it has made in India. The economy of the second most populous country in the world is inextricably linked to the pulse of its agricultural success or failure. The green revolution in the late 60’s saw the country through a period of what could otherwise have been the worst famine in the world. Yet after nearly three and half decades into the post green revolution period, the country still faces crisis each year in trying to meet the burgeoning demand for food by its people. As the result of information technology application in agriculture, precision farming is a feasible approach for sustainable agriculture. Precision Farming or Precision Agriculture is generally defined as information and technology based farm management system to identify, analyse and manage spatial and temporal variability within fields for optimum productivity and profitability, sustainability and protection of the land resource by minimizing the production costs. The use of inputs (i.e. chemical fertilizers and pesticides) based on the right quantity, at the right time, and in the right place. This type of management is commonly known as “Site-Specific Management”. Precision farming makes use of remote sensing to macro-control of GPS to locate precisely ground position and of GIS to store ground information. It precisely establishes various operations, such as the best tillage, application of fertilizer, sowing, irrigation, harvesting etc., and turns traditional extensive production to intensive production according to space variable data. PA is facilitating the prospects and scope for switching over to modern agriculture leaving the traditional one by utilizing right resources in right time and management, which results an environment friendly sustainable agriculture.

*Keywords*: Indian agriculture, Precision farming, sustainable agriculture, remote sensing

**IMPACT OF PROTECTED HORTICULTURE SKILFUL TRAINING ON TRIPLING THE INCOME OF UNEMPLOYED RURAL YOUTHS**

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Investment in training and skill development has come to be considered as an asset for organizational development and it’s in fact safe to say that, training is indispensable for effective organization development also. Therefore, the credibility of any training programme for employees lies in its usefulness and significance to the needs of both the employees and their organizations at large. In this concern, the Hi-tech horticulture is becoming popular with the help of...
NHM and NHB. The farmers are diversifying from traditional crops to Horticultural crops for higher income. Poly house and Shade net house are being established continuously under various Government schemes. After sometime poly house and shade net house become old, damaged and haphazard. In this situation, the farmers depend on big companies for repair and maintenance of poly house and shade net house. But, companies show their interest in establishing new one as compare to repair and maintenance. So, due to lack of technically skilled person at grass root level, Poly house and Shade net house could not be repaired which were major constraints in adoption of poly house and shade net house, but the poly house and shade net house plays important role in enhancing of farmer income. In this context it essential to trained youth for repair of poly house and shade net house which helpful in self employment generation and to provide services for poly house and shade net house repair at grass root level. A training of 20 youth was conducted on repair and maintenance of poly house and shade net house. Apart from the revenue generation, the participants formed a group and they earned 6.25 lakh in 1½ year through the repair and maintenance of dozens of Shade net and poly house in Rajasthan and Madhya Pradesh. Total 25 youths were engaged for 636 days and earned Rs. 624997 as service component. The monitores impact of training was that their income increased from Rs. 250 per day to Rs. 982.70 per day.

Key words:- Poly house, shade net, repair, maintenance,skill.

ROLE OF AGRICULTURE AND ALLIED SECTORS (ANIMAL HUSBANDRY, FISHERIES, SERICULTURE, FORESTRY) IN INDIAN ECONOMY

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Indian economy is classified in three sectors - Agriculture and allied, Industry and Services. Agriculture plays a vital role in India’s economy. Indian agriculture sector accounts for 18 per cent of India's gross domestic product (GDP) and provides employment to 50% of the countries workforce. Livestock provides livelihood to two-third of rural community. It also provides employment to about 8.8 % of the population in India. India has vast livestock resources. Livestock sector contributes 4.11% GDP and 25.6% of total Agriculture GDP. Fish and fish products have presently emerged as the largest group in agricultural exports of India, with 10.51 lakh tonnes in terms of quantity and Rs.33,442 crores in value. Sericulture is an important cottage industry in India contributing roughly to 5% of GDP. Forests provide several goods which serve as raw materials for many industries. Wood grown in forests serves as a source of energy for rural households. Survey of India states its forest cover increased to 69.8 million hectares by 2012, per satellite measurements; this represents an increase of 5,871 square kilometres of forest cover in 2 years. Forestry industry contributed 1.7% to India's GDP.

PUBLIC-PRIVATE PARTNERSHIP (PPP) MODEL - PRESENT NEED

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Public-private partnership (PPP) is a funding model for a public infrastructure project such as a new telecommunications system, airport or power plant. The public partner is represented by the government at a local, state and/or national level. The private partner can be a privately-owned business, public corporation or consortium of businesses with a specific area of expertise. PPP is a broad term that can be applied to anything from a simple, short term management contract (with or without investment requirements) to a long-term contract that includes funding, planning, building, operation, maintenance and divestiture. PPP arrangements are useful for large projects that require highly-skilled workers and a significant cash outlay to get started. They are also useful in countries that require the state to legally own any infrastructure that serves the public. Examples of PPP models: Design-Build (DB), Operation & Maintenance Contract (O & M),Design-Build-Finance-Operate (DBFO), Build-Own-Operate (BOO), Build-Own-Operate-Transfer (BOOT), Buy-Build-Operate (BBO), Build-lease-operate-transfer (BLOT), Operation License, Finance Only etc .

CRYOPRESERVATION: A BETTER TECHNIQUE TO CONSERVE GERMPLASM OVER THE CONVENTIONAL METHODS

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Conservation in field gene banking is not a safer strategy anymore because of pest, disease and adverse weather conditions. Their maintenance is labour-intensive and requires vast areas of land. Conservation of germplasm in the form of in vitro cultures has been adapted as a safer method for conservation for safety duplication of the field collections, rapid
multiplication and distribution of disease-free plant material. However, in recent times, cryopreservation i.e. storage of germplasm at ultra-low temperature (196°C) in liquid nitrogen has been advocated for long term storage of germplasm than in vitro conservation which provides only short term conservation. Cryopreservation is a cost-effective long term method of conservation of germplasm and successfully used for conservation of diverse plant materials like apices, zygotic embryos, cell suspensions and calli. It is highly effective for vegetatively propagated and recalcitrant seeds where the normal conservation methods are not successful. It has also found its use in cryoselection, cryotherapy and in biotechnology in recent times. Cryopreservation protocol needs to be standardized so that this technique can be applied for a wide range plant species. There is a need to develop easy protocols and understand the complex cytochemical and biochemical changes involved in cryopreservation. Till date, no standard cryopreservation protocol is available which can be used widely and can be applicable to a variety of plant species. Each time, the protocol has to be standardized. So there is a need to co-ordinate between the private and the public sectors and between various countries to implement cryopreservation for conserving the germplasm for large scale application.

**Keywords:** Cryopreservation, Germplasm, Recalcitrant seeds, Long term conservation.

**SYNTHESIS OF STEROID-BASED MOLECULAR IMPRINTED POLYMER AND THEIR MOLECULAR RECOGNITION STUDY FOR DRUG COUNTERFEITING STUDY**

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**Introduction:** Molecular imprinting technology is a new and revolutionary way of producing recognition sites for specific analyte in synthetic polymers. This imprinting technology can be used to generate polymeric materials with recognition sites providing high selectivity and affinity for template molecules. Objective: Recognition of two steroid compounds, β-estradiol and testosterone were studied using a synthesized molecular imprinted polymer and distinguished counterfeit drug. A molecular imprinted polymer (MIP) was prepared by non-covalent molecular imprinting approach. The number and nature of functional groups present in a β-estradiol and testosterone molecule seemed to be suitable to design specific recognition cavities with the non-covalent approach. Surface characteristics were investigated by Scanning Electron Microscope (SEM) measurements. Methodology: For MIP synthesis, β-estradiol and testosterone were used as template molecule; the polymer was synthesized via non-covalent interaction using methacrylic acid as functional monomer, ethylene glycol dimethacrylate as cross-linker and azobisisobutyronitrile as initiator. The MIP prepared have a strong and specific affinity for both steroids, using non-covalent approach. Release of template was performed by continuous extraction with methyl alcohol containing 10% acetic acid in a soxhlet extractor. After completion of the extraction rebinding experiment was carried out to separate analyte of interest from the sample matrix. The analyte eluted from MIPs by methanol was analysed by U.V and study of surface morphology is carried by scanning electron microscope. Result: The SEM clearly shows that pores were embedded in the network of the MIPs, and that there were substantial differences in morphology between the MIPs and Non Imprinted Polymers (NIPs). The NIPs had a smoother structure with small cavities and surface area than those of the MIPs, which indicates that the increase of surface area of MIPs was because of imprinting. Conclusion: This research presents MIP as interesting biomaterial for analyte identification and separation of drugs from complex biological matrices and may serve as useful references for identification of other steroidal drugs.

**DYNAMICS OF GRAZING LAND RESOURCE AVAILABILITY AND UTILIZATION IN CENTRAL REGION OF UTTAR PRADESH**

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Based on primary and secondary data pertaining to the availability, utilization and conservation of grazing land resources at a village level in Indo-Gangetic plains of India, the paper highlights that there has been a significant decline in the grazing land resources over the last 15 years. Only 53.1% of grazing lands and forest land resources are actually available for grazing purposes. Out of available grazing land resource, the main source of grazing is forest land (72.46%) followed by culturable waste lands (16.56%). The scenario at the district level is also the same, as the area of grazing lands has decreased from 71
thousand ha in 1991-92 to 48.2 thousands ha during last 25 years. The intensity of grazing is 16 animals per ha. The village is acutely deficit in green fodder availability against its requirement, and the farmers resort to grazing of animals (except costly milch animals) to optimize the nutritional constraints. The worst sufferers are the livestock owners having very less or no availability of cultivated land. Neglect, poor maintenance and overgrazing have resulted in most of the grazing resources declining to a poor and degraded condition. Farmers lack guidance, extension service and the requisite sensitization to efficiently manage these resources. The role of village-panchayat institution in efficient management of grazing land resources is almost negligible. Much detailed work at ground level for green fodder production, grazing land maintenance and conservation is desired with the active involvement of multi-stakeholders and under the ambit of a national policy in this regard.

**Keywords:** Land-use, grazing land resources, livestock production, fodder demand, grazing practices, grazing land maintenance and conservation

**MOLEULARLY IMPRINTED POLYMERS FOR SELECTIVE DETERMINATION OF ENVIRONMENTAL POLLUTANTS – A REVIEW**

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Molecular imprinting technology is a new and revolutionary way of producing recognition sites for specific analyte in synthetic polymers. This imprinting technology can be used to generate polymeric materials with recognition sites providing high selectivity and affinity for template molecules. The molecularly imprinted polymers (MIPs) are synthetic polymers possessing specific cavities designed for a target molecule. By a mechanism of molecular recognition, the MIPs are used as selective tools for the development of various analytical techniques such as liquid chromatography, capillary electro chromatography, solid-phase extraction (SPE), binding assays and biosensors. This review describes the application of MIPs to the determination of environmental pollutants in these different analytical approaches with a special emphasis on their potential as selective SPE sorbent for the selective extraction of target analytes from complex matrices. Present review reports the principle of synthesis of MIPs and the different approaches to evaluate their selectivity. Their use in different analytical techniques for the determination of pollutants in complex environmental matrices is discussed with a special emphasis on their potential as SPE sorbent.

**AGRICULTURAL MARKET INFRASTRUCTURE**

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Efficient marketing infrastructure such as wholesale, retail and assembly markets and storage facilities is essential for cost-effective marketing, to minimize post-harvest losses and to reduce health risks. Markets play an important role in rural development, income generation, food security, and developing rural-market linkages. Experience shows that planners need to be aware of how to design markets that meet a community's social and economic needs and how to choose a suitable site for a new market. In many cases sites are chosen that are inappropriate and result in under-use or even no use of the infrastructure constructed. It is also not sufficient just to build a market: attention needs to be paid to how that market will be managed, operated and maintained. Most market improvements that have been only aimed at infrastructure upgrading and have not guaranteed maintenance and management have failed within a few years. Rural assembly markets are located in major production areas and primarily serve as places where farmers can meet with traders to sell their products. These may be occasional (perhaps weekly) markets, such as haat bazaars in India and Nepal, or permanent. Terminal wholesale markets are located in major metropolitan areas, where produce is finally channelled to consumers through trade between wholesalers and retailers, caterers, etc. The characteristics of wholesale markets have changed considerably as retailing changes in response to urban growth, the increasing role of supermarkets and increased consumer spending capacity. These changes may require responses in the way in which traditional wholesale markets are organized and managed. Retail marketing systems in western countries have broadly evolved from traditional street markets through to the modern hypermarket or out-of-town shopping center. In developing countries, there remains scope to improve agricultural marketing by constructing new retail markets, despite the growth of supermarkets, although municipalities often view markets primarily as sources of revenue rather than infrastructure requiring development. Effective regulation of markets is essential. Inside a market, both hygiene rules and revenue collection activities have to be enforced. Of equal importance, however, is the maintenance of order outside the market. Licensed traders in a market will not be willing to cooperate in raising standards if they face competition from unlicensed operators outside who do not pay any of the costs involved in providing a proper service.
ECONOMICS OF POTATO CULTIVATION IN AZAMGARH DISTRICT
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The study showed that average holding size on overall farm was 1.553ha and cropping intensity was 217.92 percent. Cropping intensity was inversely related with the size of farms. The per farm average investment on overall farm came to Rs. 242208.79 and maximum share was under the head of building i.e. 57.00 percent followed by farm machinery and livestock share. The overall average cost of cultivation (C<sub>3</sub>) per hectare was Rs. 78154.62 and Gross income came to Rs. 123527.20, which offers a net income of Rs. 4537250. Among the various resources considered under study the cost if seed showed significant relationship at 1 per cent level of probability in marginal category if farms and it was significantly associated at 5 per cent probability level in small and medium size group of farms. Another factor of production i.e. manure and fertilizer was found significantly associated with dependent variable at 1 per cent level probability in all farm situation. The some of elasticity shows that potato cultivation was characterized as decreasing return to scale and positive value of marginal product indicate towards the further scope of expenditure on input to earn more that the cost. Problem related with hired human labor and technical knowledge were notice at 1<sup>st</sup> and 2<sup>nd</sup> rank by the sample farmers.

STUDY ON TEMPERATURE DEPENDENT DIELECTRIC PROPERTIES OF HONEY FOR QUALITY ASSESSMENT
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Honey is a natural food produced by honey bees, mainly composed of sugars. Monosaccharides represent about 75% of the honey sugars, 10–15% are disaccharides and the rest are small amounts of other sugars. Strong biological effects of honey and its positive influence on human health caused by prebiotic, antioxidant, antibacterial functionalities of certain constituents are very well proven. It is defined as a pure and natural product that does not include other substances. Honey is very often adulterated or improperly treated causing quality decrease and reduction of therapeutic value. The high price of honey and its limited availability results in adulteration by adding water or inexpensive sweeteners as well as overheating. Temperature and water content have been proved to be the most important factors influencing dielectric properties of food materials. Due to adulteration dielectric properties of honey changes and hence the quality which affect human health. In this study we measure dielectric constant of different brands of honey and dielectric properties at different temperature conditions. Results tends to determine the quality of honey by comparing with standard value of dielectric properties.
Key words: Honey, Honey quality, Dielectric constant, Temperature

FOOD PROCESSING AND VALUE ADDITION TO ENTREPRENEURSHIP FOR RURAL DEVELOPMENT
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Food processing is the process of value adding of fruit and vegetables by using various techniques like grading, sorting and packaging etc., Which enhances the shelf life of food products. Unprocessed foods are susceptible to spoilage by biochemical processes, microbial attack and infestation. India is the second largest fruits and vegetables producer in the world. Although around 30% of total production gets waste due to lack of improper knowledge about post harvest handling, storage, packaging and lack of cold chain infrastructure. In India only 2-3% of total production of fruits and vegetables are processed which is extremely low as compared to the international averages. The market for processed foods in India is growing significantly with it's increased consumption by the present-day consumers. The past decade has withstand a radical development on India's food processing sector but still the processing level in India is low when compared to it's vast production. Hence, it should be realised that it's increase would in turn drive up the Indian economy. As a regulatory mechanism, the ministry of food processing industry acts as a catalyst to bring greater investment for entrepreneurs guiding and helping the industry to create a conductive environment for it's healthy growth. Entrepreneurship need more focus and emphasize for tapping all such cashing opportunities. It play a vital role in diversification and commercialization of agriculture, enhances shelf life, ensure value addition to agro products, generates employment, enhances income of the farmers and create market for export of agro foods. However there are lot of barriers in the entrepreneurship of food processing pertaining to technology, finance, marketing and export. There is urgent need to provide facilities for entrepreneurs to running up of economically viable unit.
Key words: Food Processing, Infrastructure, Entrepreneurship, Barriers.
Agriculture is considered as main stay of livelihood for two-third of rural population in Himachal Pradesh. Vegetable plays an important role in the state agriculture by providing food, nutrition and economic security to the people. About 88 percent land holding are marginal and small and growing of foodgrain crops are not profitable. Farmers are diversifying their cropping pattern towards vegetable crops. This will increase income and employment in the area. The area and production of vegetable crops in the state has increased over the period but, the returns from vegetable production is depended on the optimum use of inputs and their efficient use. Therefore, the present study was undertaken in Nagrota Bagwan block of Kangra district to study the socio-economic pattern and problems faced by vegetable growers. Three stage random sampling technique was used to select a representative sample of 60 vegetable growers from Nagrota Bagwan block of Kangra district. On an average literacy-rate of 96 per cent was recorded on the sample farms. The average size of land holdings was 0.68 hectares per farm. The results emanated showed that there was a cropping intensity of 200.59 per cent on the sample farms. The total household income was calculated as Rs 291619 per farm and the vegetables contributed around 46 per cent to the total household income. The major problems reported by the vegetable growers were scarce & costly labour, non-remunerative prices for produce, inadequate training facilities, lack of extension facilities and non-availability of seeds of desired quality. The policy implications suggested the need of awareness creation among the vegetable growers to make better use of improved technologies and enhance farm mechanization. There is also a need to diversify their cropping pattern towards vegetable cultivation to increase their farm income.

**NEED OF CANNING OF FRUIT AND VEGETABLE IN FOOD INDUSTRY**

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Fruits and vegetables contribute important nutrients for the human body. Eating fruit and vegetable lowers the risk of developing many chronic diseases and can also help with weight management. Canning a method of preservation in which a cooked or uncooked food is sealed in tin plated and lacquered steel cans. The sealed cans are sterilized by heat treatment under high pressure in retort. The temperature required for effective sterilization varies with the pH of the product and is generally higher than boiling point of water (100°C or 212°F). The vegetable canning is similar to fruit canning except that the filling materials in case of vegetables is brine solution. The vegetables require thorough cleaning and slicing before passing through canning line. Since vegetables are low in acid it does not require lacquered cans. Canning is the process of sterilizing and sealing foods in airtight containers to preserve them. To retain nutrients and optimum quality, preserve fruits and vegetables when at their peak of freshness. Clean the food thoroughly before processing. Salt and/or sugar may be added to canned fruits and vegetables but these ingredients are not essential for a safe product. Microorganisms live and multiply quickly on the surfaces of fresh food and on the inside of bruised, insect-damaged, and diseased food. Oxygen and enzymes are present throughout fresh food tissues. These practices remove oxygen; destroy enzymes; prevent the growth of undesirable bacteria, yeasts, and molds; and help form a high vacuum in jars. Good vacuums form tight seals which keep liquid in and air and microorganisms out.
ASSESSMENT OF ENERGY CONSERVATION THROUGH AUDIT: REVIEW
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India is the 7th largest energy producer, 4th largest energy consumer and at 5th position as CO₂ emitter in the world. India is with 17.5% of the world population, having only 1% of available energy source. The fundamental goal of energy management is to produce goods and provide services with the least cost and environmental effect. In any industry, the three top expenses are often found to be energy (both electrical and thermal), labour and materials. Energy audit will help to understand more about the ways, energy and fuel are used in any industry, and help in identifying the areas where waste can occur and where scope for improvement exists. The world is moving in the direction of environmental protection. There is all-round serious discussions/conferences to save the planet from Green House Gases, as the effect of these gases are alarming, i.e. it is killing wild life, creating health problems, rise in sea level, non-uniformity in seasons, ecology is totally disturbed and increase in flood situations. The increase of the so called greenhouse gases which also include methane, ozone, nitrous oxide etc. causes a rise of the earth’s temperature. The use of renewable energy reduces the CO₂ emission through a reduction of the demand for fossil fuels. At the same time, by capturing uncontrolled methane emissions, the second most important greenhouse gas is reduced. Energy auditing in different field will assist to minimization of energy losses, proper energy conservation/management, reduce the harmful impact of global warming and shows the field where we can use renewable energy sources instead of non renewable energy. India is located in the equatorial sun belt of the earth and receives abundant solar radiation. Most parts of India experience 250 to 300 clear sunny days in a year. The average daily global solar radiation received in India varies between 4 to 7 kWh/m²/day that too for 5 to 5:30 hours per day.

ADVANCE ESTIMATION OF CROP YIELD THROUGH APPLICATION OF REGRESSION MODEL
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Estimation of crop production before harvest are required for marketing, price, import, export storage etc. Due to lack of proper storage facilities approximately 35 percent of the total is destroyed. To overcome from this situation, the storage need can be easily managed by advance estimation of crop yield. After using the available technology and proper demonstration, it is possible to increase the productivity. Regression analysis is a statistical forecasting model that is concerned with describing and evaluating the relationship between a given variable (usually called the dependent variables) and one or more other variables (usually known as the independent variable). The first stage of the process is to identify the variable to predict the dependent variable, then carry out regression analysis focusing on the variable. Then, regression analysis identifies the relationship between the dependent variable and the explanatory variables. Stepwise regression uses to screen out the important variables and by the help of different regression approach are subsequently employed to estimate model parameters. All possible regression analysis was carried out to select the best combination of variables on the basis of some important statistics such as C.V, R² Adjusted R², RMSE, Residuals & cook’s D statistic. Finally, on basis of statistics viz. C.V, R² Adjusted R², RMSE, Residuals & cook’s D statistic, the best fitted model is selected for forecasting.

Keyword: Yield estimation, Regression analysis, Statistical tools, Statistical model

ENHANCING NUTRITIONAL SECURITY AND ECONOMIC EMPOWERMENT OF WOMEN FARMERS OF INDIA
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The world population has increased to about 7.4 billion, out of which India’s population is 17.86 percent, the second most populated country after China. Such a drastic growth brings forward challenges like shrinking resources, demands for quality food, achieving nutritional security, poverty and socio-economic development. Amongst these the availability of adequate amount of quality food i.e. achieving food security along with the nutritional security to the growing population is utmost crucial and important factor. Women farmers play an active and important role in agriculture. In developing countries like India, women’s are the building blocks managing the food security of their family, unfortunately, they are also suffering from

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malnutrition as they always tend to neglect their own health as priority on taking care of others. In lieu with this, Division of Agricultural Extension, ICAR-IARI has initiated steps ahead by leading a project funded by UNDP towards enhancing nutritional security and empowering farm women’s of India. The current study is based on the results and outcomes of the above stated project, in which we surveyed and trained the total of 2000 women’s. The study was conducted in the selected villages of districts Mewat, Jhajjar and Sonipat of Haryana state. Results revealed that there was about 40 percent increment in the level of knowledge of the women in terms of nutrition, value addition and post-harvest management of the nutri products such as Bajra ladoos, Bajra pops, Soy tofu, Soy milk etc. Additionally, based on the pre and post-tests, women’s were found to have high entrepreneurial motivation to start their own ventures for their improved nutritional as well as socio-economic development. A pool of 725 nutripreneurs have emerged till now at micro levels who have started their ventures by selling the nutritionally rich food products at village and district level. The data pertaining to the same including the demographic profiling of the women is also discussed in the paper. This approach can be replicated in other locations which will yield positive impact in terms of economic empowerment and nutritional security.

RURAL WOMEN KEY TO SUSTAINABLE FOOD SECURITY
RAVI SHANKAR GIRI*, VIRENDRA KAMALVANSHI, MONU KUMAR JHA, NAVNEET KUMAR SINGH AND SAKET KUSHWAHA

The Food and Agriculture Organization has defined food security not only in terms of access to, and availability of food, but also in terms of resource distribution to produce food and purchasing power to buy food, where it is produced. This implies that food security is a broad concept dealing with production, distribution and consumption vis-à-vis food entitlement for all household members. According to UN, ‘Human Development Report,’ there is no country in the world in which women’s quality of life is equal to that of men. It is estimated that 20 per cent of the world’s population suffers from hunger and, at the extreme; 850 million of them endure chronic malnutrition. The problem of food insecurity is evidently seen as 88 countries, nearly half of which are situated in Sub Saharan Africa, where over 100 million people suffer from hunger. More than half of the continent’s food insecure population lives in Ethiopia and other six African countries, namely Chad, Democratic Republic Congo, Uganda, Zambia and Somalia. They account for over 40 per cent of the population in Africa. Worldwide about 850 million people are hungry people. In India 212 million i.e. 25 per cent of people suffer from hunger and they are mainly marginal farmers, landless rural poor, urban poor and fishermen. Women are both producers and providers of food in developing countries. Apart from participating in a wide range of productive activities, they are also carrying out full responsibility not only in bearing and caring children but also in nurturing and breast-feeding them after birth. How can their contributions be measured relative to other members of the family? Food Security, at the individual, household, national, regional, and global levels [is achieved] when all people, at all times, have physical, social, and economic access to sufficient, safe, and nutritious food to meet their dietary needs and food preferences for a healthy and active life FAO (2001). This study focuses on five pillars of food security viz., availability, accessibility, adequacy, utilization and stability. Women’s contribution to food security is important for household food security, nutritional food security and national food security. The right to food is a fundamental human right. Yet; millions of people suffer the “ravages of hunger and malnutrition or the consequences of food insecurity”. Though rural women lack control over land, finance, decision making, and restriction on movability, lower wages rate harsh working condition. Still the contribution to food security cannot be overlooked. They tend to be responsible for food production, processing, distribution and marketing of food and child care etc. In agriculture rural women account for as much as 84 per cent of the labour force in India. India has largest food schemes and programmes in the world which are ICDS, MDMS, and Annapurna. Still there are many issues which require attention of the Government for women which are SITRA, DWCRA, and SGSY. A shift is needed from development to empowerment of women in economic stand and social choice.

Keywords: Food security, Sustainable, Accessibility, Utilization, Stability.

ORGANIC FOODS
RENU BALA SHARMA

Organic food, food raised without chemicals and processed without additives. Organic food refers to crops or livestock that are grown on the farm without the application of synthetic fertilizers or pesticides, and without using genetically modified organisms. In contrast, the type of agriculture followed by most farmers, which does include the use of synthetic pesticides and fertilizers, is termed conventional agriculture. Organic foods are made according to certain production standards. In 1939, Lord Northbourne coined the term organic farming. Food whose ingredients are at least 95% organic by weight may carry the USDA Organic Label products containing only organic ingredients are labeled 100% organic. Organic gardening uses organic seeds, organic, organic fertilizers, compost, organic root, stimulators and organic pest control.
MALNUTRITION GROWS IN THE SOIL: A REVIEW
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Globally, India is considered as the fastest growing nation as far as its economy is concerned however malnutrition still grows as an epidemic after so many decades have passed on after Independence. According to Global Hunger Index, India ranks 100 among 119 nations as reported by International Food Policy Research Institute in 2017. Although, India topped in production of major food staples globally. According to Global Nutrition Report 2017, India carries a serious burden of Anaemia, Obesity and Malnutrition. Malnutrition are often believed to be associated with starvation and underweight. However, malnutrition is defined by National Institutes of Health as the condition that occurs when your body does not get enough nutrients. India also faces dual burden of obesity along with malnutrition. In India, child and maternal malnutrition are often believed to be a bigger concern than child and maternal obesity which is rising as an epidemic for the future generations and may lead them to various comorbidities associated with obesity. Therefore, it is a very necessary to explore more about the multiple factors that may be responsible behind Malnutrition. Soil Health deterioration is rising as one of the biggest concern behind nutritionally poor outcome of crops. I want to draw the attention of researchers towards the need of more research on Nutritional Insufficiency of the staple foods and to find out the associated factors that may be responsible behind nutritionally inadequate crops. Along with proper strategies, farmers and consumers both should be given nutritional awareness to overcome with Malnutrition.

Keywords: Malnutrition, Starvation, Obesity, Comorbidities, Soil Health

IMPORTANCE OF CONSERVATION TILLAGE ON PHYSICAL PROPERTIES OF SOIL
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Today world is facing population explosion and there is urgent need to increase the farm productivity for ensuring food security. Due to high yielding varieties, imbalanced use of fertilizers and intensive/conventional agriculture for increasing farm productivity, there is degradation of soil health, quality and environment. Conservation agriculture is the best option to increase the farm productivity to ensure food security on sustainable basis. Conservation agriculture aims to conserve, improve and make more efficient use of natural resources through integrated management of available soil, water and biological resources combined with external inputs. It contributes to environmental conservation as well as to enhance and sustained agricultural production. Conservation tillage is one of the importance components of the conservation agriculture which involves reducing the tillage operations and retention of plant residues at the soil surface in the ratio of at least 30%. Conservation tillage affects soil compaction and enhances soil aggregation, improves hydraulic conductivity, increases soil porosity, water storage and soil organic carbon of soil. The increase in soil organic carbon influences soil structure and water transmission properties. Thus, conservation tillage leads to favourable changes in the physical and chemical properties of a soil and provides the best opportunity for restoring and improving soil productivity; however, the magnitude of changes varies with the texture of the soil, tillage operations, soil moisture and climate.

Keywords: Conservation tillage, food security, sustainability, soil health and quality

APPLICATION OF GREEN CHEMISTRY IN DIFFERENT FIELDS
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Green chemistry, also called sustainable chemistry, is an area of chemistry and chemical engineering focused on the designing of products and processes that minimize the use and generation of hazardous substances. Applications of green chemistry include the use in pharmaceutical industry, along with new methodologies that decrease or eliminate the use of solvents, or render them safer and more effective. Green chemistry has also motivated numerous ways to synthesize petroleum-based chemicals from biological materials instead, regularly plant matter or waste. Green chemistry has different industrial applications in designing safer chemicals production, food &flavor Industry, and green technologies in the pharmaceutical Industry, paper &pulp industry, polymer industry, sugar &distillery industries, textile and tannery industry and green chemistry in agrochemicals. Green chemistry also plays an important role in alternate energy science, and
the production of novel methods to make solar cells, fuel cells, and batteries for energy storage. Self-assembling molecules uses bio-based plant materials which also involves green chemistry principles. Chemically synthesized agrochemicals are harmful to the environment as they are non-biodegradable and are produced by environmentally unfriendly processes.

The main goal of green chemistry is to reduce or eliminate waste in the manufacture of chemicals and its allied products, which has inspired the design of green next generation catalysts. Other developments in green chemistry are the trend toward redesigning chemical products to reduce their risk.

Keywords: Pharmecutical industry, polymer industry, reduce waste

SOIL CONDITIONER - A CONTRIVANCE FOR IMPROVING SOIL QUALITY
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A soil conditioner is a product which is added to soil to improve the soil’s physical qualities, usually its fertility (ability to provide nutrition for plants) and sometimes its mechanics. In general usage, the term "soil conditioner" is often thought of as a subset of the category soil amendments, which more often is understood to include a wide range of fertilizers and non-organic materials. Soil conditioners can be used to improve poor soils, or to rebuild soils which have been damaged by improper soil management. They can make poor soils more usable, and can be used to maintain soils in peak condition. Soil quality is the capacity of a specific kind of soil to function within ecosystem and land use boundaries, to sustain biological productivity, maintain environmental quality, and sustain plant, animal and human health. Soil conditioner improves the physical, chemical and biological quality of soil. It includes Minerals (e.g. gypsum, lime, etc.), Modified rocks and minerals (e.g. sand, clay, rockwool, pumice, etc.), Industrial by-products (e.g. steel mill slag, press mud), Organics (e.g. compost, sea weeds, humates, etc.), Microbes (e.g. Blue green algae- Anabaena, Spirulina, etc.) and Synthetic Polymers (e.g. polyacrylamide, poly vinyl alcohol, Hydrogels, etc). Soil conditioners optimize one or more soil physical properties, such as bulk density, porosity, aggregate stability, dispersivity parameter, erodibility, rain splash detachment, soil crusting, hydraulic conductivity, water retention characteristics, plant-available water capacity, air capacity, infiltration rate and cumulative evaporation. Many of the soil conditioners increase total microbial counts of sandy and calcareous soils. Application of Cyanobacteria as soil conditioner in salt affected soil resulted in significant improvement in the aggregation status of soil by producing exo-polysaccharides and brought down appreciably the pH, electric conductivity and exchangeable sodium, furthermore they increased considerably the hydraulic conductivity of soil. In this era of intensive agriculture where our soil and environment are under threat of degradation, soil conditioners are helpful to improve its quality.

Keywords- Soil conditioner, Soil Quality, Soil properties

IMPORTENCE OF PRADHAN MANTRI FASAL BIMA YOJANA IN AGRICULTURE SECTOR
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Pradhan Mantri Fasal Bima Yojana is an effective initiative taken by the Ministry of Agriculture and Farmers Welfare, Government of India. The PMFY launched in April 2016 by merging two schemes i.e.; NAIS & mNAIS with some improvement. This project paves way for a farmer to get his crop insured. The new crop insurance scheme is in line with One Nation – One Scheme theme. The PMFMY will replace the existing two schemes National Agricultural Insurance Scheme as well as the Modified NAIS. Pradhan Mantri Fasal Bima Yojana (PMFY) aims at supporting sustainable production in agriculture sector by way of, encouraging farmers to adopt innovative and modern agricultural practices, ensuring flow of credit to the agriculture sector; which will contribute to food security, crop diversification and enhancing growth and competitiveness of agriculture sector besides protecting farmers from production risks. Coverage of crops are food crops (cereal, millets, pulses), oilseeds, and annual commercial/horticultural crops. Premium Rates for rabi, kharif and annual commercial crop is 1.5%.2.0% and 5.0% of SI(sum insured) or actuarial rate (whichever is less) respectively.

Keywords: Premium Rates, innovative, NAIS & mNAIS, etc

REVIEW OF RURAL DEVELOPMENT PROGRAMMES IN INDIA
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The current population of India is 135 crores as on September, 2018, based on the latest United Nations estimates. Thus, nearly 70 per cent of the India’s population lives in rural areas. The Rural development generally refers to the process of improving the quality of life and economic well-being of people living in rural areas. Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA) is considered as a “Silver Bullet” for eradicating rural poverty and unemployment, by way of generating demand for productive labour force in villages. It provides an alternative source of livelihood which will have an impact on reducing migration, restricting child labour, alleviating poverty, and making villages self-sustaining through productive assets creation such as road construction, cleaning up of water tanks, soil and water conservation work etc. For which it has been considered as the largest anti-poverty Programme in the world. In this topic, we discuss to improve the conditions of rural people. Government of India launched some schemes through the planning commission of India such as Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA), Pradhan Mantri Ujjwala Yojana (PMUY), Indira Awas Yojana (IAY), Sampoorna Grameen Rojgar Yojana (SGRY), Integrated Tribal Development Project (ITDP), Integrated Rural Development Programmes (IRDP), Pradhan Mantri Gram Sadak Yojana (PMGSY), Integrated Child Development Services (ICDS), Development of Women and Children in Rural Areas (DWCRRA), Rastriya Krishi Vkash Yojana (RKVY) and Bharat Nirman etc. Bharat Nirman is an Indian business plan for creating and augmenting basic rural infrastructure. These rural populations can be characterized by mass poverty, low levels of literacy and income, high level of unemployment, poor nutrition and health status. In order to tackle these specific problems, a number of rural development programs are being implemented to create opportunities for improvement of the quality of life of these rural peoples. All these schemes are aimed to reduce the gap between rural and urban people which would help reduce imbalances and improve the standard of living of rural areas peoples.

**Keywords:** MGNREGA, DWCRA, SGRY, IRDP, PMGSY, ICDC, IAY

**ROLE OF MASS MEDIA IN PROVIDING EDUCATION**

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John Dewey stated that education could not be limited within teacher and taught without social environment. So mass media is one such potent force in the social environment of education. Through modern electronic techniques and technologies, mass media prove that education is, really comprehensive not confined within four walls of the classroom. Really, mass media are the educational medium for the mass and mass education. Irrespective of caste, colour, geographical, sociological, economical diversities mass media prove as an important means for the education to all. Mankind gets a great deal of information from the widespread mass media i.e. newspaper, TV, radio, magazines, journals, films, etc. It is estimated that mass media may substitute the real classroom teaching in future. Television programs, internet websites, feature-length films, newspapers, music tapes and CDs, magazines, billboards, radio programs: essentially, a tool/technology which is used by someone to transmit a message to a large external audience as mass media. Therefore, mass media are the main means of educating the society. These are the cheapest and quickest means of the education for the people. The impact and motivation is very quick through mass media. The teacher must use the educational media and methods effectively in the classroom.

**GOVERNMENT POLICIES AND PLANNING FOR SUSTAINABLE DEVELOPMENT IN INDIA**

**RUBELA ABSAR**

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Development implies overall positive change in the quality of life of the people. It is a process and method of developing something. Sustainable development is the development that is likely to achieve durable satisfaction of human wants and improvement in the quality of life of the people. It helps the poor societies who are left with no option rather than demolish their environment to survive. In India, the goal of sustainable development needs to bring the development and environment together into one set of target. The improper balance between the environment and development is the fault line every time in global conferences. Governance is an ongoing process that has to continually adapt to new situations, challenges and the opportunities provided by new technologies for the planning and development in India.

**Keywords:** Development, Planning, Environment, Governance...

**INFLUENCE OF KNOWLEDGE ON STUDENTS IN SCHOOL VEGETABLE GARDEN AND GARDEN ACTIVITIES**

**S. DILIP AND ALLAN THOMAS**

Venue: Sardar Patel Auditorium, Swami Vivekanand Subharti University, Meerut (U.P.) India 20-22 October, 2018
Agricultural activities have produced a variety of educational benefits in primary school students. It has deepened the recognition of the importance of feeling nature, enhanced the ability of self-control and widened the understanding toward work. At disabled children's schools and in classes of disabled children, agricultural activities have immensely contributed to the development of these children, academically and socio psychologically. Kerala Agricultural University also supports agricultural school outreach programmes through its extension system and student social bodies like National Service Scheme with an aim to improve the knowledge, skill, attitude and understanding of the school children on agriculture with special reference to vegetable gardens. The focus of school gardens has shifted in purpose from production, loyalty, and safety to health and nutrition. Health and school officials see the school classroom and the lunchroom as associations for garden nutrition programs. Hands-on nutrition programs based on the use of gardens increased the number of fruits and vegetables children eat on a daily basis, particularly as healthy snack choices (Lineberger and Zajicek, 2000).

**Key words:** Agriculture, School Vegetable garden.

**JOB OPPORTUNITIES IN AGRICULTURE SECTOR THROUGH ASCI**

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As we all know that, present time nobody wants to do work as agriculturist, neither farmers nor non-farmers. Everyone wants a white collar job. Hence, thousands of rural youths and school dropouts are continue migrating from villages to metropolitan cities to earn their livelihood. Considering above facts, Agriculture Skill Council of India (ASCI) was established on 4th January, 2013 as Section 8 Company under the Companies Act, Ministry of Corporate Affairs. It is working under the aegis of Ministry of Skill Development & Entrepreneurship (MSDE), GOI. The endeavor of ASCI is to bridge the gap between laboratories and farms. ASCI works towards capacity building by upgrading skills of farmers, wage workers, self-employed and extension workers engaged in organized / unorganized segments of Agriculture & Allied Sectors. ASCI have eminent experts, representatives from Government Bodies, Academicians, Boards, Industry Association, Industry, Growers Associations, etc. in the Board of Governing Council. ASCI envisions to touch/upgrade skills of cultivators, agricultural labourers and direct & indirect labour engaged in organized and unorganized agriculture and allied industry. ASCI is contributing to nation building through Skill Development in Agriculture especially at the times when country's agriculture is experiencing stagnant growth, exodus of quality manpower to other sectors, changing climate with increased variability in production parameters and transformations in international agriculture markets that are especially too much subsidized challenging the competitiveness of Indian Agriculture. ASCI has taken upon itself the responsibility of transforming Indian Agriculture through developing the skills of country's manpower in emerging areas of agriculture.

**Keywords:** Job opportunities, agriculture sector, skill development, rural youth

**UTILIZATION OF HONEY AS SWEETENER FOR THE PREPARATION OF COW MILK LASSI**

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The present investigation entitled “Utilization of honey as sweetener for the preparation of cow milk lassi” was undertaken during the year 2014-2015 at Animal Husbandry and Dairy science section, college of agriculture, Nagpur. Milk was standardized to 3.5 per cent fat and used for preparing dahi. Then lassi prepared with addition of sugar at 15% (T1), honey @ 10% (T2), 12% (T3) and 14% (T4) per cent by weight of dahi. The product was analyzed for chemical composition like fat, protein, total solids, titratable acidity, ash and moisture as well as for sensory attribute like colour and appearance, body and texture, flavour and overall acceptability. The cost of production was also calculated by considering the retail market prices of different ingredients used. The data revealed that total solid (%) of lassi were increased with increase in level of honey. While fat (%), protein (%), titratable acidity (%), ash (%) and moisture (%) were decreased with increase in level of honey. The fat content was decreased from 3.42 to 3.27 per cent, total solids content decreased from 17.30 to 21.34 per cent, protein content decreased from 3.10 to 2.62 per cent, titratable acidity decreased from 0.85 to 0.76, ash content decreased from 0.70 to 0.53 and moisture content decreased from 82.70 to 78.66 per cent respectively. The significantly highest score for colour and appearance (8.16 out of 9), body and texture (7.79 out of 9), flavour (7.89 out of 9) and overall acceptability (8.38 out of 9) were obtained in lassi containing 12 per cent of honey. The cost of production of lassi was increased with increase in the level of honey. The cost of production was higher with 14 per cent honey level (Rs. 93.78 per kg) while cost of the lassi prepared by blending with 12 parts of honey level was Rs. 86.86 kg⁻¹.

**Keywords:** Plain lassi, lassi blended with honey as sweetener, physicochemical parameters, sensory attributes, cost structure
AN ECONOMIC ANALYSIS OF RICE BASED CROPPING SYSTEMS IN RATNAGIRI DISTRICT OF MAHARASHTRA


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The study was conducted at Department of Agricultural Economics, Dr. B.S. Konkan Krishi Vidyapeeth, Dapoli Dist. Ratnagiri with objectives to estimate cost, return and profitability of rice based cropping systems in Ratnagiri district of Maharashtra. In this study, primary data were collected from 120 farmers by personal interview method with the help of pre-tested schedule. Simple tabular analysis was applied for the comparison of yields and inputs used by the farmers. Economics of individual crop and crop combination was worked out. The standard cost concepts used in farm management studies. Results showed that in study area six farming systems followed by farmers. From the finding of present study, total cost higher found in FS-I (Rs.109617) and least total cost in FS-IV (Rs. 68436). The per farm gross returns were maximum in FS-III (Rs. 148377) followed by FS-II (Rs.128837), FS-I (Rs. 126304), FS-VI (Rs. 115794), FS-IV (Rs. 87787) and FS-V (Rs.76876), which indicated higher returns in farming systems in which irrigated plantations were undertake. Among all the farming systems FS-III, FS-II and FS-VI were found highly profitable than other farming systems. The FS-II (Paddy+Pulses+Irrigated plantation) and FS-III (Paddy + Irrigated plantations) plays a major role in profitability of the farming systems. Which underline its importance and need to concentrate on these enterprises for making farming systems more profitable. Therefore, the proper balance between livestock enterprises and crop enterprises need to be encouraged to bring remaining farming systems more profitable.

Keywords: Rice, farming systems, cost and profitably.

EFFECT OF VARIOUS SPACING GEOMETRIES ON TREE GROWTH AND SOIL PARAMETERS IN POPLAR BASED AGROFORESTRY SYSTEM IN NORTH-WESTERN INDIA

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There is wide spread expansion in market of poplar in northern India, used extensively in pulp and paper, match splints, pencil and plywood industries. The practice of closer spacing with compact block in poplar does not permit intercropping of kharif crops from the third year onwards, which discourages small landholders. Therefore, poplar were planted at Chaudhary Charan Singh Haryana Agricultural University, Hisar (India) in three spacing geometry of 5×4m, 10×2m and paired-row (18×2×2m) at a constant density of 500 trees ha\(^{-1}\) during 2008. Tree growth parameters revealed that with the advancement of age, a gradual increase in DBH and height was observed with maximum DBH (28.7 cm) and height (22.2 m) was attained at 8 year. The overall growth pattern of poplar followed a rising trend with age in all three spacings. The height of poplar after 8-years of plantation was affected significantly in different spacings under agroforestry. The height and DBH growth of poplar in 5×4m spacing was at par with 10×2m spacing, whereas, the lowest tree height (20.8 m) and DBH (27.4 cm) were recorded in paired-row spacing of poplar at the time of harvesting may be due to more intra-line competition of poplar plants for different growth resources. The 10×2m and 5×4m spacings produced 20 per cent and 6 per cent more growth in terms of DBH over paired-row spacing, respectively. In case of soil, after eight years, the soil pH and Electrical Conductivity was found non-significant among all the spacings of poplar and control. However, there was a decrease in soil pH and EC as compared to its initial value in 2008. Among different spacings, the highest pH (7.8) and EC (0.13 dSm\(^{-1}\)) recorded in 18×2×2m spacing. The soil organic carbon was significantly influenced by tree spacing and increased from its initial status (0.58 %) under different spacing of poplar-based agroforestry system. The average contents of organic carbon in 5×4m, 10×2m, 18×2×2m spacings were higher by 64, 50, and 41% over sole crop, respectively. The various spacing geometries of poplar had considerable effect of growth parameters of trees as well as soil properties.

Keywords: Poplar, agroforestry, soil properties, growth parameters.

GERMICIDAL EFFECT OF ULTRA VIOLET (UV-C) ON SAFETY AND QUALITY OF FRESH AND MINIMALLY PROCESSED FOODS COMMODITIES

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UV light is a range of electromagnetic radiation found in nature. UV is situated between visible light and X-rays having wavelengths between 10 nm to 400 nm and this spectrum has invisible to humans eyes. UV-C (254 nm) found in sunlight and it is completely absorbed in the upper layer of atmosphere by ozone. UV-C waves have germicidal effect so it very effective to inactivate microorganisms at ambient condition. The exposure to UV-C light is a powerful non-thermal technology to inactivate microorganisms and enzymes in food commodities. Major microbes involving fruits and vegetables have been
associated with common foodborne pathogens such as Salmonella, Shigella spp., Escherichia coli O157:H7 etc. This risk can be reduced by minimal processing non thermal treatment like UV-C without affecting physico-chemical properties of food commodities. It will preventing diseased and enhancing shelf life and quality of food commodities. It is also having effect on pesticide degradation. When it combine with catalyst like TiO₂ will enhance the degradation efficiency of pesticides residues content in food commodities. UV-C have been widely used to degrade pesticides, fungicides and insecticides that cannot be removed by conventional methods. So UV-C technology is very effective for decontamination of microorganisms as well as degradation of pesticides residues in food commodities. UV-C technology is easy to use as well as low equipment, energy and maintenance cost. It’s having promising effect on food processing.

DEVELOPMENT OF CHICKEN MEAT KABABS BY USING SHATAVARI ROOT POWDER
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The study was conducted with an objective to evaluate the effect of Shatavari (Asparagus racemosus) root powder on quality characteristics of chicken meat kabab. The chicken meat kabab were prepared with incorporation of 1% shatavari root powder and the nutritional and physio-chemical characteristics of product is studied. Shatavari root powder addition showed significantly higher moisture and lower fat content as compared to control chicken meat kabab. The incorporation of Shatavari root powder also decreased the cholesterol and free fatty acid content as compared to control sample. However, the emulsion stability and cooking yield were higher in Shatavari (Asparagus racemosus) root powder chicken kababs. The addition of Shatavari root powder in the products resulted lower thiobarbituric acid content as compared to control product. The pH values are less affected in treated products compare to control. The shear press value was lower for Shatavari (Asparagus racemosus) root powder chicken meat kabab as compared to control. It is concluded that addition of Shatavari root powder at 1% levels improved the nutritional and physio-chemical properties of chicken meat kababs.

Keywords: Shatavari root powder, chicken meat kabab, quality

SYNTHETIC AND SPECTRAL STUDIES OF COMPLEXING BEHAVIOR OF PERCHLORATO COMPLEXES OF 4 [(N-BENZOPHENONE) AMINO] ANTIPYRINE (C₂₃H₂₁N₃O)

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Trivalent Lanthanide behaves as hard acids and therefore expected to form stronger stable complexes with ligands having N-donor atoms. Complexes of Lanthanides with coordination number less than six are uncommon. Pyrazolones have been reported to be potential extractants as well as powerful drugs and form complexes with Lanthanides. Complexes were prepared by adding a methanolic solution of Lanthanide (III) perchlorato in a hot methanolic solution of ligands in 1:3 molar ratio. The characterization of newly synthesized complexes was done by using infrared spectroscopy, electronic spectroscopy, magnetic susceptibility, molar conductance and molecular weight.

Keywords – Lanthanide perchlorato complexes, Pyrazolones, Magnetic susceptibility, Infrared Spectroscopy, Electronic Spectroscopy

USE OF MOBILE PHONE AMONG FARMERS FOR AGRICULTURAL DEVELOPMENT

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In India, access to information can possibly enable better incomes and productivity to the farmers. Mobile phone usage at present world is playing a vital role for the enhancement of farmers business towards agriculture. Estimates states that 60% of farmers do not access any source of information for advanced agricultural technology resulting in huge adoption and communication gap. Telecommunication, especially mobile phones have the potential to provide solutions to the existing information symmetry in various lagging sectors like agriculture. This topic has tried to find the answers to the use and impact of mobile phones and mobile enabled services. The answer to these questions is relevance to develop farmer. Government and other related departments appreciate mobile phones as easy, fast and convenient way to communicate and
get prompt answers of respective problems. Through this important technology, they directly keep in touch with market personnel and offer their produce with reasonable price. Furthermore, videos on 3G and 4G phones were found to have a high information utility to illiterate farmers as well as e-governance, ICT’s, e-marketing, e-banking were easier way rather than offline mode. Mobile phones has an potential to transform the typically top-bottom nature of information flow from extension agents to farmers and given new directions and approach to farmers to communicate directly and share about recent advances with each other. However the impact mobile phones, can act as catalyst to improving farm and rural incomes, have saved energy and time of farmers, the quality of information and trustworthiness of information are the three important aspects that have to be delivered to the farmers to meet an opportunity of farmers and rural development workers to communicate, facilitate, adapt, retrieve, localize and discriminate a broad range of information.

**Keywords:** Mobile, Farmers, Communication, Information, ICT’s, etc.

**ECONOMICS OF FARMING SYSTEMS IN NAGAUR DISTRICT OF RAJASTHAN**

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Farming is a dynamic biological and open system with human or social involvement being primarily biological with a high degree of dependence on weather variables and changing socio-political environments. The main objectives of the farming system is to develop efficiency in farm production, increasing non-farm employment has also become essential for improving income and living standard of rural population. Different farming systems are prevailing in India primarily due to varied agricultural base, available resources, and location specific needs of humans, animals etc. This study has been done to analyze the economics of the farming systems in Nagaur district of Rajasthan. For the selection of sample farmers, a multistage sampling procedure was adopted for the selection of districts, blocks, villages and farmers in the study area. The purposive sampling technique was employed to select 50-60 respondents comprising equal number of small, semi-medium, medium and large farmers across the study area. The primary data required for the study was obtained through personal interview method using pretested schedule prepared for the purpose. The highest household income has been observed in case of the system containing rain-fed and irrigated crops with livestock rearing. The farming systems can be minimizing the need for external inputs. Such as expanded analysis of farming systems will be useful in planning for technology generation and transfer in the Indian agriculture.

**ENHANCING CROP AND IRRIGATION WATER PRODUCTIVITY OF DIRECT SEEDED BASMATI RICE (ORYZA SATIVA L.) THROUGH DRIP FERTIGATION**

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Rice (Oryza sativa L.) a high water requiring crop is one of the most pivotal food crops in the world and a staple grain for more than half of the world population. Irrigation and nutrient management is important for obtaining higher rice grain yield. Giving right amount of water and nutrients at the right time is important for obtaining higher efficiency which is a crucial property of drip irrigation system. Drip fertigation enables accurate adjustment of water and nutrient supplies to meet the crop requirement. Information on use of drip fertigation for improving the basmati rice productivity is lacking. The present study envisages finding out precise package of fertigation management for direct seeded basmati rice during rainy season. Irrigation at 150% CPE recorded 16 % and 5.5 % more grain yield than 100% CPE and 125 % CPE, respectively. It remained at par with 125% CPE level but was significantly superior to 100% CPE level. All the drip irrigation levels were found superior to conventional DSR practice. Nutrient level of 100% NPK recorded significantly higher grain yield than 50% NPK level. It was at par with 75% NPK level. Drip irrigation at 150 mm CPE recorded 6.9 and 22.3 % higher straw yield than 125 and 100% CPE, respectively. Among the NPK levels, crop fertilized with 100% NPK recorded the maximum and significantly higher straw yield than lower doses of NPK. In the rice cropping season, the irrigation water applied was lowest (19.8cm) in 100% CPE leading to irrigation water saving of 58.6 % in comparison with DSR conventional. All the drip irrigation levels recorded higher irrigation water productivity than conventional DSR practice. Among the drip irrigation levels, the irrigation water productivity was found highest at 100 % CPE. Crop fertilized with 100 % NPK recorded highest irrigation water productivity of 274 kg/ha-cm.

**NEED FOR NATIONAL AGROFORESTRY POLICY IN INDIA**

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Agroforestry is a dynamic ecologically based, natural resource management system, diversifies and sustain production through the integration of trees on farms and in agriculture landscape, for increasing social, economic and environmental benefits to the users at all level. (ICRAF, 1998). The rapid increase in human population has put tremendous pressure on natural forest resources, creating an environmental crisis which probably may increase in magnitude in the foreseeable future. The adoption of improved agroforestry systems is one of the alternative mean to counter this ongoing process of resource exploitation and environmental degradation. (DAC, 2014). Economic studies of agroforestry systems have shown that financial benefits are a consequence of increasing the diversity and productivity of the systems which are influenced by market and price fluctuations of timber, livestock and crops. In addition to higher yield potentials of agroforestry, product diversification increases the potential for economic profits by providing annual and periodic revenues from multiple outputs throughout the rotation and reducing the risks associated with farming single commodities. Small as well as large farmers’ can increase return over variable cost on their farms by reallocating the existing household resources. Introduction of floriculture and apiculture as additional activities in small as well as large farms increase return over variable cost. (Rana et al). The multivariable benefits and services generated are recognized as a tool to improve the livelihood status of farmers. Commercial agroforestry gained momentum in the regions where it got support from industry and assured market facilities. However, lack of policy initiatives and strict trade regulations has not supported wide adoption of agroforestry. Though prominent agroforestry models are being developed in different parts of the country, there is no clear-cut mechanism from seed procurement to marketing of the products. In this context, the National Agroforestry Policy, 2014 came in limelight to address the issues of quality planting material, tree insurance, restrictions on transit and harvesting, marketing of agroforestry produce, research and extension. (Dhyani et al, 2015).

ENHANCING NUTRITION OF RURAL FAMILIES THROUGH KITCHEN GARDEN
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Kitchen gardening is one of the world’s most ancient food production practices and is practiced throughout the world. Homestead production of fruits and vegetables provides the household with direct access to important nutrients that may not be readily available or within their economic reach. Establishment of Kitchen Garden in rural areas is easy due to availability of space and farm families are already engaged in agriculture practices. Kitchen gardening contributes to household food security by providing direct access to food that can be harvested, prepared and fed to family members, often on a daily basis. Kitchen gardens can be grown in the empty space available at the backyard of the house or a group of women can come together, identify a common place or land and grow desired vegetables, fruits, cereals etc that can benefit the women and community as a whole. There is also support for expanding economic base through production, processing, packaging and marketing, this also enhances their entrepreneurial activities and creates small jobs. So, kitchen gardening would be a good mean to improve household food security. If technical support and proper training were provided especially on new gardening techniques and variety selection then Kitchen gardening helps in improving the nutritional security of households in rural areas.

Keywords: Kitchen gardening, nutrition and rural.

UP-CYCLING: THE MANAGEMENT AND CONSERVATION OF DISCARDED DENIM
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Excessive spending and the ever-changing fashion trends lead to an increase in material production to meet consumers’ needs, which also in turn, increase the amount of industrial waste and many harmful pollutants. To address this problem, have to follow the up-cycling process. Up-cycling is a process in which used materials are converted into something of higher value and/or quality in their second life. It has been increasingly recognized as one promising means to reduce material and energy use, and to engender sustainable production. By fully understanding the role and benefits of up cycling, further recommendations on techniques of up-cycling can be taken into consideration. Thus, it can be applied to ensure better and effective usage of those materials and products particularly in interior space, in order to conserve and preserve natural resources. Denim is a durable cotton twill textile, typically used to make jeans, overalls, and other clothing. This process makes diagonal ribbing of denim that distinguishes it from cotton duck, another twill fabric. Denim one of the most widely used material in the world, has significant impact on environment in manufacturing and waste management stage. Denim up-cycling has opened vast opportunities for savings in the use of natural resources as raw materials, energy and water consumption, chemicals and auxiliaries and waste water treatment. By up-cycling the waste denim, used-denim and discarded denim material, reconstructing them into edgy and functional designs for everyday products. These proposed up-cycling
ideas serve as a great alternative for consumers to actively participate in reducing carbon emission, water usage, and waste to landfill by utilizing used clothing.

Keywords: Up-cycling, natural-resources, conserve, denim, waste management.

COMPARISON OF DEM’S USED FOR WATERSHED DELINEATION THROUGH ARCSWAT AN EXTENSION TOOL OF ARCGIS
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Watershed delineation is the prior most step for any study regarding watershed management. Earlier the delineation was done with the help of topographic sheets available from the Survey of India, but nowadays, with the advancement of technology it can be accomplished by processing the freely available digital elevation models of higher spatial resolution. Three digital elevation models i.e. ASTER (ASTGDEMv2_0N29E080), SRTM (SRTM1N29E080V3) and CartoDEM (C1_DEM_16b_2005-2014_V3R1_80E29N_H44O) each with spatial resolution of 1-Arc-Second (30 m) and map projection geographic (WGS84), were used to delineate watershed. ASTER and SRTM DEM’s were downloaded from USGS Earth Explorer website and Cartosat- Digital Elevation Model (CartoDEM) was downloaded from Indian Space Research Organisation’s Geoportal Bhuvan. ArcSWAT, an extension tool of ArcGIS uses input (DEM) defined in projected coordinate system, the UTM zone was identified through Google Earth options as 44N. Therefore, all DEM’s were projected to WGS_1984_UTM_Zone_44N using ArcGIS Data Management Tools. Using all three projected DEM’s watershed delineation was performed using ArcSWAT, an extension tool of ArcGIS and the shapefiles were converted to kml files (keyhole markup language) using ArcGIS Conversion Tools so as to export and compare them, as demarcated by the ridgeline on Google Earth. The best result was achieved using the CartoDEM as the watershed boundary almost coincided with the ridgeline. ASTER GDEM is a product of METI and NASA.

Keywords: Resolutions, Projection Systems, kml

SOME PHYSICAL AND FRICTIONAL PROPERTIES OF APPLE FRUITS AVAILABLE IN MARKET OF MEERUT
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Several physical and frictional properties as physical characteristics, mechanical, hydrodynamic and nutritional properties of two apple varieties (Red Delicious and Golden Delicious) procured from market, were determined and compared using Duncan’s multiple range test. Physical characteristics such as: average fruit length, width, thickness, the geometric, arithmetic and equivalent mean diameter, projected area, surface area, sphericity index, aspect ratio, fruit mass, volume, true density and moisture content, were determined for both varieties. The coefficient of static friction on plastic, plywood and galvanized iron, flesh firmness, failure stress, modulus of elasticity were found. The terminal velocity, coming up time, bouncy and drag forces, as hydrodynamic properties and total dry matter, total soluble solid, pH and titratable acidity, as nutritional properties, were determined. It was concluded that most of properties of two apple varieties was statistically different at the one percent probability level. The static and dynamic coefficients of friction were determined for two apple cultivars against four different surfaces (masonite, rubber, paper, plastic) at surface moving velocities of 0.43 to 15.60 mm/s. Over this range of velocities, friction coefficients increased by 28 to 98%. Sliding velocity affected dynamic coefficient more than preloading velocity affected the static coefficient. Differences between the tested surfaces were most pronounced at the intermediate velocity of 5.11 mm/s. The effect of velocity and surface varied inconsistently between the two cultivars.

NEED OF ZERO BUDGET NATURAL FARMING FOR SUSTAINABLE AGRICULTURAL DEVELOPMENT
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Healthy soil is the foundation upon which sustainable agriculture is built. Farming practices differ mainly based on soil inputs and crop protection measures. In conventional chemical farming practice, indiscriminate use of chemical fertilizers and pesticides destroy the beneficial soil micro flora, change the soil nature and also contribute to the high crop production cost. Heavy metals from the polluted soil may enter the food chain in significant amounts and show adverse health effects. The essence of natural farming is to minimize the external inputs to the farm land and nurture the soil fertility. Zero Budget Natural Farming is a unique method of farming which requires absolutely no monetary investment for purchase of key inputs
like seeds, fertilizers and plant protection chemicals from the market. The farmer can grow hardy local varieties of crops without application of chemical fertilizers and pesticides. Dependence on hired labours is also reduced to the bare minimum as the system discourages intercultural operations. All the system requires is native breed of cattle which in any case forms an integral part of farming families in rural areas. It is claimed that one cow is sufficient to take up this method of farming on thirty acre of land (Devarinti, 2016). In ZBNF, soil is supplemented with the microbial inoculums like Beejamrutha and Jeevamrutha to accelerate the propagation of soil microflora, beneficial to soil enrichment. 200 liters of jeevamrutha is sufficient for one acre of land. Apply the jeevamrutha to the crops twice a month along with the irrigation water or as a 10% foliar spray. The treatment of seeds of any crop Beejamrutha is done by mixing by hand; dry them well and use them for sowing. For leguminous seeds, just dip them quickly and let them dry. Other philosophy of the ZBNF is to nurture the growth of these beneficial microorganisms without using external manure and chemical pesticides. Indigenous pesticides of leaves with cow urine, Agniastram, Neemastram and Bramhastram are used. According to Palekar the need of water requirement of plant is fullfill by the waaphasa because the plant roots need the water vapour (Waaphasa). Whaphasa is the condition where there are both air molecules and water molecules present in the soil, and it encourages reducing irrigation, irrigating only at noon, in alternate furrows etc. The farmers report a significant decline in need for irrigation in ZBNF. Hence, there is about 90% of water saving. Mulching is the covering of the field that will prevent the growth of weeds and evaporation from the crop field, hence, reducing the water loss upto 30 %. Straw mulch and live mulch increases the soil organic matter, nitrogrn content by biological nitrogen fixation and microbial population after decomposition (Prasada, 2016). It can be calculated that Zero Budget Natural Farming is more beneficial as compared to conventional agriculture because it has less economic requirement for crop production. ZBNF is having no adverse impact on soil and environment as compared to modern agriculture because no chemical fertilizers and pesticides are used in it. Use of natural inputs in crop production increased the quality of the product and it fetched more profitability.

STUDY THE SHELF LIFE OF PANEER AND ITS QUALITY ANALYSIS

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Paneer, a popular indigenous dairy product of India, is similar to an unripened variety of soft cheese which is used in the preparation of a variety of culinary dishes and snacks. It is obtained by heat and acid coagulation of milk, entrapping almost all the fat, casein complexed with denatured whey proteins and a portion of salts and lactose. Paneer is marble white in appearance, having firm, cohesive and spongy body with a close-knit texture and a sweetish-acidic-nutty flavour. Preparation of paneer using different types of milk and varied techniques results in wide variation in physico-chemical, microbiological and sensory quality of the product. Paneer blocks of required size are packaged in laminated plastic pouches, preferably vacuum packaged, heat sealed and stored under refrigeration. Paneer keeps well for about a day at ambient temperature and for about a week under refrigeration (7 °C). The spoilage of paneer is mainly due to bacterial action. Successful attempts have been made to enhance the shelf life of paneer. Milk is utilized by three main groups-household sector, un-organized sector and organized sector, converting it into various products such as paneer, curd, butter, ghee, sweets, powder, cheese, liquid milk, etc. Paneer is one of traditional dairy products of India which is preparations like, patties, sandwiches, shahi paneer, etc. It is estimated that about 5% of the total milk produced in India is converted into paneer. Paneer provide an easy means of conserving and preserving valuable milk solids during the flush season or in high milk producing area and transporting it to the region where either milk production is scanty or the terrain is hard for easy transportation of milk. Paneer has a fairly high level of fat and protein, low level of sugar and contains some important minerals (eg. calcium) and vitamins. Paneer is recommended for diabetic patients, dental carries, growing children and pregnant women due to high calcium and protein.

Keyword: paneer composition, quality analysis, production, study shelf life of paneer.

DEVELOPMENT OF VITAMIN FORTIFIED LOW FAT PANEER

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Vitamin fortified low fated paneer is prepared by using low fat milk i.e. skim milk with addition of vitamin premix and then sensory is to be carried out for checking the quality of the product. The study was to compare the qualitative and quantitative properties of skim milk paneer, toned milk paneer, standardized milk paneer and whole milk paneer and to compare a quality of low fat paneer and normal fat paneer for diet. Skim milk had more total solids than standardized milk and toned milk.
Milk of 5.0-6.0% fat can be found to make quality paneer. Since paneer is mostly used for cooking purposes, the relatively high level of fat may not be an absolute requirement for an acceptable product. With this view in mind, an attempt was made developing paneer of low fat content. Generally paneer is made from 5.0 to 6.0% fat milk which final product fat content is near about 26% is very high for the diet persons. But in this study four different fat level milk i.e. 0.6%, 4.5%, 3.0% and 0.5% are used for paneer preparation and according to hedonic scale and proximate analysis paneer prepared from the milk with 3.0% fat is having good acceptability. Paneer prepared from this milk is having 15% fat in final product. It indicates that the difference of fat in normal paneer and low fat paneer is near about 10%. From this comparative study of different fat level in paneer was concluded that the paneer made from low fat milk is acceptable with good hedonic points. Due to its carrier properties, Milk can be fortified with vitamins like A or D improving its nutritional properties. So the objective of this study is to prepare a vitamin fortified low fat paneer as commercial scale by adding vitamin premix in milk during preparation of paneer and to compare the qualitative and quantitative properties of vitamin fortified paneer and normal paneer.

Keywords: Low Fat Paneer, Milk Fortification, Proximate Analysis, Comparison With Normal Paneer, Sensory Analysis

DIGITAL EMBROIDERY: AN IMAGINATION

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Embroidery is decoration worked on the surface of the fabric using thread. Selection of design, embroidery stitches and colours and a very striking effect can be created. Old clothes can get a new lease of life by adding just a dash of embroidery. All basic embroidery stitches are easy. Several basic stitches can be combined to produce rich embroidered pieces. It can be beautifully described as a painting with needle and thread. Now, embroidery is largely produced on computer controlled embroidery machines. They are specially engineered machines that have a multi-needle fixed ‘embroidery head’ and a frame holder that moves the framed product in either of two directions so that the embroidery design can be sewn. The design is created within a grid (known as a ‘field’) with x being the horizontal axis and y the vertical axis. The embroidery machine reads these co-ordinates from the design data file and moves its pantograph into position to receive each new stitch from the machines’ stationary needle head. The embroidery design is created on a computer using specialized ‘digitizing’ software. The computerized embroidery process can be broken down into six functional activities: Interpret artwork and digitize the design using specialized software, Save the design as a stitch file that can understood by the embroidery machine, Read the stitch data file into the embroidery machine, Teach the machine how to embroider the design, Frame or hoop the fabric you wish to embroider on and slot into the machine arms. Start the machine stitching and run until embroidery design is complete and finished. This paper showed how designs can be created with embroidery software. With the help of software which benefited the experimenting with a number of colours, textures, patterns and sketch backgrounds for producing a playful, distinct and animated design, without physically making a articles.

Keywords: embroidery, stitches, computerized, process, creation, designs.

ROLE OF ON-LINE COMMUNICATION TECHNOLOGY IN AGRICULTURE DEVELOPMENT

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On-line Communication technology has been considered as a tool that can be used to achieve development goals in developing countries. These technologies may help to fight against disease, unemployment, poverty, agriculture and other development problems. Agriculture plays a huge role in the society and the economy of the country. Nowadays, new advanced technologies are used for agricultural development, such as satellites, the Internet, mobile phone and social media. On-line Communication Technology can be used to improve agricultural information and farming methods with transformational development. In India around 70% of population earns its livelihood from agriculture. Agriculture needs continuous diffusion of new technology to meet global food security, poverty reduction and environment sustainability. On-line Communication Technologies in agriculture have the potential to facilitate greater access to information that support knowledge sharing. They facilitate the creation, storage, retrieval, and dissemination of any relevant data, and information.
that may have been already been processed and adapted. On-line Communication Technology in agriculture is an emerging field focusing on the enhancement of agriculture development in India. They can provide accurate information for the farmers which facilitates better agriculture output. But in Indian still in growing stage and evolving as an emerging trend the benefit of On-line Communication Technology is yet to reach all the farmers. Perhaps technological innovation many farmers, especially who are share croppers are not getting proper information and service due to poor economic condition and social constraints. Other factors are illiteracy, language barriers and unwillingness to adopt the new technology. The way in which On-line Communication Technology projects access, assess, apply, and deliver content may increase the likelihood of On-line Communication Technology used by farmers and thus may become an important factor in a project success. To address the information needs of farmers, relevant content is a key component of On-line Communication Technology projects.

ADOPTION AND IMPACT OF BT COTTON IN INDIA

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Genetically modified (GM) crops are seen as the milestone of the food and fiber security in the world. 189.8 mb of land across the world was under GM crops in the year 2017 and India is the fifth largest country in term of acreage. Bt cotton is the most commercial GM crop in India, which was introduced in the year 2002. India remains as the top producer of cotton with 96% of total cultivated cotton being GM. Although the production has increased, but yield has dropped in the later years. It has led to discontent in farmers, textile industry and other related stakeholders. A report prepared by Cotton Advisory Board of India shows that there is threefold increase in the cost of production of cotton due to the increase in the cost of pesticide, seeds and other inputs. In 2016, 80% of cotton crops failed in Raichur district incurring the loss of over 2.72 crores. This led for review of adoption and socioeconomic impact of Bt cotton on Indian agriculture. This paper examines the documents from 2002, year of introduction of Bt cotton in India and reviews the adoption and socioeconomic impact of it making the necessary recommendation for the present and future.

Keywords: Bt Cotton, Genetically modified crops, Adoption, Socioeconomic Impact

ROLE OF KISAN CREDIT CARD SCHEME IN INDIA

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Kisan Credit Card Scheme was introduced in 1998-99 by Indian banks has since become an excellence program providing access to short-term credit in the agricultural sector. This model scheme was prepared by the National Bank for Agriculture and Rural Development (NABARD) on the recommendations of RVGupta Committee. Its objective is to provide timely and adequate credit support to the farmers from the formal banking system in a flexible, hassle-free and cost-effective manner. Participating institutions include all commercial banks, Regional Rural Banks, and state co-operative banks. In order to ensure that all eligible farmers are provided with hassle-free and timely credit for their agricultural operation. Marginal farmers, sharecroppers, oral lessee and tenant farmers are eligible to be covered under the Scheme. The main objectives of the Scheme are to meet the short-term credit requirements for cultivation of crops, post-harvest expenses, produce marketing loan, consumption requirements of farmer household, working capital for maintenance of farm assets and activities allied to agriculture, like dairy animals, inland fishery etc. investment credit requirement for agriculture and allied activities like pumping sets, sprayers, dairy animals etc. KCCs have now been converted into Smart Card cum Debit Cards to facilitate its operation through ATMs. The scheme has short-term credit limits for crops and term loans. KCC credit holders are covered by personal accident insurance up to Rs. 50,000 for death and permanent disability and up to Rs. 25,000 for another risk. The validity period is five years, with an option to extend for up to three more years.

Keywords: KCC, Agricultural Information.

PRODUCTION PERFORMANCE OF POULTRY GENOTYPES UNDER TRADITIONAL SYSTEM OF REARING IN KONKAN REGION OF MAHARASHTRA

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The present experiment was conducted at Poultry Unit, Department of Animal Husbandry and Dairy Science, Dr. B. S. Konkan Krishi Vidyapeeth, Dapoli, Maharashtra to assess the comparative growth performance and feed efficiency of...
poultry genotypes. The experiment was carried out on four different types of poultry genotypes viz., - Kadaknath (T₁), Vanaraja (T₂), Giriraja (T₃) and Rhode Island Red (T₄). For this experiment, 200 one day old chicks were divided in five replications and each replicate have 10 birds. Results showed that Giriraja birds gain significantly higher daily body weight gain, weekly body weight gain and total body weight gain with superior feed conversion efficiency compared to Vanaraja, Kadaknath and Rhode Island Red. The benefit cost ratio (B: C ratio) higher achieved by Kadaknath birds. From the results of present investigation, it can be suggested that the rearing of Kadaknath as well as Giriraja poultry birds are more beneficial and efficient than Vanaraja and RIR in Konkan Agro-climatic condition of Maharashtra.

**Keywords:** Feed efficiency, growth rate, poultry breeds, weight gain, net profit.

**ZERO BUDGET NATURAL FARMING (ZBNF)**

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Zero Budget Natural Farming (ZBNF), which is a set of farming methods, and also a grassroots peasant movement, has spread to various states in India. It has attained wide success in southern India, especially the southern Indian state of Karnataka where it first evolved. It is also called Spiritual Farming. Indian farmers increasingly find themselves in a vicious cycle of debt, because of the high production costs, high interest rates for credit, the rising costs of fossil fuel based inputs, and private seeds. More than a quarter of a million farmers have committed suicide in India in the last two decades. The word ‘budget’ refers to credit and expenses, thus the phrase 'Zero Budget' means without using any credit, and without spending any money on purchased inputs. 'Natural farming' means farming with Nature and without chemicals, so the production cost will be zero. In the ZBNF nothing has to be purchased from the outside. All things required for the growth of the plant are available around the root zone of the plants. There is no need to add anything from outside. Our soil is prosperous-full of nutrients but only 1.5 to 2.0% is taken up from the soil and remaining 98 to 98.5% nutrients are taken from air, water & solar energy. Science also says that 98% crop body is constituted by air and water. It is said that there is nothing in the soil and we have to add fertilizers from outside but in the forest or on the bunds of our farm, there are huge trees of Mango, Tamarind or Plum with uncountable export quality fruits in famine also without any application of chemical or organic fertilizers, insecticides, without any cultivation by tractor, without irrigation. There is no existence of any technology of the Agriculture, no fertilizers, insecticides, cultivation and irrigation. Even though these trees are giving enormous expert quality fruits every year in famine also. That means, for the plants to grow and to give the production there is no necessity of adding from outside. The method involves mulching, intercropping, and the use of several preparations which include cow dung. These preparations, generated on-site, are central to the practice, and said to promote microbe and earthworm activity in the soil. There are four pillars of ZBNF, that are:- Jivamrita/Jeevamrutha, Bijamrita Acchadana, Whapasa. Jivamrita/Jeevamrutha, is a fermented microbial culture. During the 48 hour fermentation process, the aerobic and anaerobic bacteria present in the cow dung and urine multiply as they eat up organic ingredients (like pulse flour). Bijamrita/beejamrutha is effective in protecting young roots from fungus as well as from soil-borne and seed borne diseases that commonly affect plants after the monsoon period. Acchadana – Mulching protects topsoil during cultivation and does not destroy it by tilling. It promotes aeration and water retention in the soil. Whapasa – moisture is the condition where there are both air and water molecules are present in the soil, and it encourages reducing irrigation, irrigating only at noon. A majority of respondents reported that by adopting ZBNF, over time they saw improvements in yield, soil conservation, seed diversity, quality of produce, household food autonomy, income, and health. Thus, ZBNF may be the new generation for agriculture.

**USE OF MOBILE APPLICATIONS IN MORDEN AGRICULTURE**

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Dynamic growth of mobile communications technology creates opportunities for economic development, social empowerment and ground level grassroots innovation in developing countries. It does farm and rural development by providing access to information, markets and services to millions of rural residents. Earlier, mobile technology was not being used as well. We used to use mobile only for interaction, but nowadays mobile phones are being used everywhere in every field. Nowadays many mobile applications are being proven to be very useful in the field of agriculture. Many applications related to agriculture are present on the Google Play Store, which farmers can use in their own benefits. In order to work towards development, Prime Minister Narendra Modi started the ‘Kisan Suvidha’ app in 2016, which provides information about the weather and the forecast of the next 5 days provides knowledge on the market value of items and crops in the nearest city, fertilizer, seeds, machinery etc. This app is available in many languages. There are some similar apps which are
ICT IN AGRICULTURE: A ROAD TO DOUBLING THE FARMERS’ INCOME

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Information and communication technology in agriculture (ICT in agriculture), also known as e-agriculture, is developing and applying innovative ways to use ICTs in the rural domain, with a primary focus on agriculture. ICT in agriculture offers a wide range of solutions to some agricultural challenges. It is seen as an emerging field focusing on the enhancement of agricultural and rural development through improved information and communication processes. In this context, ICT is used as an umbrella term encompassing all information and communication technologies including devices, networks, mobiles, services and applications; these range from innovative Internet-era technologies and sensors to other pre-existing aids such as fixed telephones, televisions, radios and satellites. E-agriculture continues to evolve in scope as new ICT applications continue to be harnessed in the agriculture sector. More specifically, e-agriculture involves the conceptualization, design, development, evaluation and application of innovative ways to use ICTs in the rural domain, with a primary focus on agriculture. Provisions of standards, norms, methodologies, and tools as well as development of individual and institutional capacities, and policy support are all key components of e-agriculture.

Keywords: e-agriculture, ICT, rural development, innovative and institutional capacity.

BAMBOO SHOOTS: MYRIAD OF BENEFITS

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Bamboo is a plant of the family Gramineae, is the longest grass in the world. Being a very versatile plant, bamboo grows in a lot of different climates. Bamboo is intricately associated with humans from times immemorial. Popularly known for their industrial uses, a lesser known fact of bamboos is the usage of its young shoots as a food that can be consumed fresh, fermented or canned. The juvenile shoots are not only delicious but are rich in nutrient components, mainly proteins, carbohydrates, minerals and fiber and are low in fat and sugars. The shoots have antioxidant capacity due to the presence of phenolic compounds. The shoots are free from residual toxicity and grow without the application of fertilizers. The increasing trends of health consciousness among consumers have stimulated the field of functional foods and bamboo shoots can be one of them. Bamboo shoots have a number of health benefits: improving appetite and digestion, weight loss, curing cardiovascular diseases and cancer by keeping these benefits in mind bamboo fiber is now a common ingredient in breakfast cereals, fruit juices, bakery, meat products, sauces, shredded cheeses, cookies, pastas, snacks, frozen desserts and many other food products.

EFFECTIVENESS OF AGRICULTURAL PROGRAMMES ON TELEVISION AS PERCEIVED BY THE TELEVIEWING FARMERS

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The present field study was conducted mainly with the specific objective to “study the effectiveness of agricultural programmes of ABP Majha and Sahyadri channel as perceived by the televiewing farmers”. The study was conducted in two tahsils namely, Mandangad and Chipulun of Ratnagiri district which were selected randomly. Twenty villages from these two tahsils were selected for the study. The data were collected by taking personally interview of 100 televiewers, 50 each of ‘ABP Majha’ and ‘Sahyadri’ channel. The televiewers of ABP Majha and Sahyadri channels differed remarkably with regard to size of land holding, annual income and mass media exposure. However, majority of the televiewing farmers of the two channels perceived ‘medium’ effectiveness of farm telecasts. There was a significant difference in the perception of televiewing farmers of ABP Majha and Sahyadri channel with respect to components of effectiveness, namely understandability, usefulness, demonstration mode of presentation, entertainment and relevancy of pictures. More than two
third of the televiewers had ‘fair’ perceived effectiveness category, 64.00 per cent of the televiewers perceived the agricultural programmes as understand to a great extent and modes of presentation of agricultural programmes namely demonstration (70.00 %), drama (59.00 %), Discussion (60.00 %) and use of visual aids (55.00 %) were ‘effective’. About 67.00 per cent of the televiewers perceived that the information telecast through agricultural programmes was ‘accurate’ and maximum numbers (70.00 %) of the televiewers were motivated to adopt few improved practices after viewing the farm telecasts.

**A SURVEY OF INVASIVE ALIEN ANGIOSPERM SPECIES OF J. P. NAGAR OF ROHILKHAND REGION, INDIA**

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**Keywords**- Angiosperms, Invasive alien species, Asteraceae, J.P. Nagar.

**USE OF MEDIA PACKAGE FOR ASSESSING THE ACCEPTANCE OF BIOGAS TECHNOLOGY BY RURAL WOMEN**

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*KVK, Jehanabad, BAU, Sabour, Bhagalpur KVK, Vaishali, DRPCAU, Pusa*

Biogas has emerged as a very promising alternate to our conventional sources of energy in rural and semi-urban areas. It is fulfilling manifolds needs of the rural population. It provides cheap, smokeless and pollution free fuel. It is used for manure production by utilising slurry. The other utilisations of biogas are for household lighting and for power production in the form of fuel engine. Biogas fuel engines help in running motor pump, in chaff cutting and in ploughing on farms. Thus, on the whole there are four sub technologies of biogas namely biogas stove, manure production, biogas fuel engine and biogas lighting which can be adopted by farming community for raising their socio-economic status and standard of living. Therefore, a study was conducted in four villages of Samastipur district of Bihar to educate the rural women with the help of a media package on the biogas technology and assess their knowledge, attitude and acceptance of the same. The media package consisted of five posters, three charts, one video cassette and one booklet which covered the most relevant messages relating to the four sub technologies of Biogas. A proportionate random sample of 120 women was drawn from the selected four village. Respondents were given intensive exposure through media package containing information related to biogas stove, manure production, biogas lighting and fuel engine. Pre-exposure and post exposure data regarding knowledge level as well as attitude level were assessed for each respondent. The study led to conclude that the pre-exposure knowledge scores obtained by majority of respondents was more than mean value. With regard to attitude level, after exposure, majority of the respondents had ‘favourable’ attitude and none of them was found to have ‘unfavourable’ attitude. With regard to acceptance of biogas technology, most of the respondents had low level of acceptance and only one-fourth of them had high level of acceptance. To conclude, frequent exposure with the help of media mix and continued sustained efforts in this direction will certainly result into better acceptance level by the farming community.

**INNOVATIVE APPROACHES IN APPLIED SCIENCES AND SOCIO-ECONOMIC DEVELOPMENT**

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To truly transform our economy, protect our security, and save our planet from the ravages of climate change, we need to ultimately make clean, renewable energy which is the profitable kind of energy. Agriculture including agricultural marketing is the backbone of Indian economy. Methods that prevailed in earlier decades for selling the produce have changed. Earlier Rural Primary Markets (RPMs) were set up whereas in contrast to this now- a-days, prices are set by the buyers and the
commission agents. The perishable products get damage in the journey of transportation, which can be resolved by the provision of refrigerated trucks. An efficient marketing system can manage timely delivery of produce, reduce marketing costs and increased production and productivity thereby, making a healthy market. With the expansion in agricultural production and agro-industries, there has been an increase in the agricultural waste which gives birth to “Agricultural Pollution”. Farmers aka Farmpreneurs don’t realize that what they burn away, causing pollution, can be used to earn as much as Rs 1000 per ton. Experts believe that the agricultural sector is now all set for revolution where farmers need to shift their attention from primary to secondary agriculture, wherein they enhance the value of the produce and utilize all products and by-products of farms, poultry houses, slaughter houses, agro-industries etc. Biomass pellets and biogas generated from the agro-waste can be a big money spinner. To minimize the waste and enhance the income of the agriculturists, the best found solution is the use of 3R’s viz Reuse, Recycle and Reduce. That is why, sustainable energy resources appear to be one of the most effective and efficient solutions. So just depending on the conventional energy sources will not solve the problem of energy crisis. In this paper efforts have been made to summarize the gradual shift towards exploring secondary agriculture and its future potential in India. This paper also assesses few policies for concentrating on the enhancement of renewable for the future. This paper is a piece of armed chair research and constitutes the knowledge from the secondary sources. The paper mainly focuses on what are the means of making money from agricultural waste and contribute to the entrepreneurship development.


KITCHEN WASTE COMPOSTING: A GREEN APPROACH IN WASTE MANAGEMENT FOR SUSTAINABLE DEVELOPMENT

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India stands second in the production of fruits and vegetables in the world. It contributes about 10% as well as 14% of fruits and vegetables in the world production. Material waste is a by-product of almost all human activities and results in stress and pollution in the environment. Waste prevention is the primary goal of the waste management. Composting is a sustainable waste management technique in developing countries; an eco-friendly approach for bioconversion into value added product which may be utilized as plant nutrients. Compost acts as a fertilizer which substitutes chemical fertilizer, reduce the load of N:P:K use and associated environmental pollution. Manure and compost not only supply many nutrients for crop production, including micronutrients, but they are also valuable sources of organic matter. Increasing soil organic matter improves soil structure or tilth, increases the water-holding capacity of coarse-textured sandy soils, improves drainage in fine-textured clay soils, provides a source of slow release nutrients, reduces wind and water erosion, and promotes growth of earthworms and other beneficial soil organisms. Microbial inoculation in kitchen waste composting may yield attributes, yield and nutritional quality of crops under field conditions. This paper aims to delineate that composting is a natural way to promote green revolution in a healthy direction thereby achieving the target of waste management and sustainable development.

Key words:- Waste management, sustainable development, Microbial Inoculation, green revolution.

GEONFORMATICS FOR THE PHYSIOGRAPHIC AND LAND USE/LAND COVER MAPPING OF SIWANI AREA, BIHWANI DISTRICT (HARYANA)

SIMMI RAJPUT

Geoinformatics is a modern technology playing very important role in the study and monitoring of the natural resources in any part of the world. This technology can be used for generating valuable information about the land use/land cover (LULC) changes, physiography, forest cover, vegetation type and landforms of any particular area. The study area falls in the toposheet no. H43V9 and three maps were formed such as base map, LULC map and physiographic map. Information collected from these maps will help in land use planning at micro level. The main aim of this paper is to determine and quantify the effect of different aspects responsible for deteriorating the agri-economic importance of land. The paper also establishes the relationship between landforms and land-use. The relation is not one-to-one but rather one landform may be under several land use types and vice versa. The results revealed that the area under landforms of Siwani block was found 676.36 km², dominated by plain area (582.13 km²) followed by sandy dunal area (42.35km²) and 475.91km² under land use/land cover with maximum of its area under fallow land (304.06km²) and (82.37km²) area under cropland. The maps
FACILITATING SUSTAINABLE AGRICULTURE BY STRENGTHENING INDIGENOUS TECHNICAL KNOWLEDGE

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Farmers in India have been using traditional practices in farming since time immemorial. Indigenous Knowledge refers to the unique, traditional, local knowledge existing within and developed around the specific conditions of women and men appropriate to a particular geographic area. It lays emphasis on minimizing the risks rather than maximizing the profits. Indigenous knowledge can play a key role in the design of sustainable agricultural systems, increasing the likelihood that rural populations will accept, develop, and maintain innovations and interventions. Indigenous knowledge from different parts of the world, its proper documentation, validation and sharing and exchange of knowledge on global basis to provide good quality food on sustainable basis with reduced adverse impact on the environment. Government schemes and Research and Development activities should reach the indigenous users and scientific rationale behind these indigenous technologies should be studied and strengthened for patenting the same. Indigenous knowledge may contribute in several ways such as by helping identification of cost-effective and sustainable mechanisms for poverty alleviation, which are locally manageable and meaningful. There is a lack of proper integration between the practice of indigenous and modern knowledge. An appropriate association between the traditional and modern scientific knowledge and technology systems has immense potential to benefit the society.

Keywords: community, indigenous, scientific rationale, sustainable

GROUNDWATER RESOURCE ESTIMATION USING GEC 2015 METHODOLOGY IN BEMETARA BLOCK, DISTRICT BEMETARA, CHHATTISGARH

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The present methodology used in India for groundwater assessment is known as Ground Water Resource Estimation Methodology – 1997 (GEC 1997). Recently, the Ground water resources Estimation Committee formulated a new methodology (GEC 2015) which has higher frequency of computation and includes the additional components in the ground water balance equation which were either ignored or considered negligible in the GEC 1997 methodology. Hence, Bemetara block of Chhattisgarh has been chosen as the study area to compute the resources using GEC 2015. The area is divided in command and non-command area with respect to surface water irrigation and ground water irrigation. Gross groundwater draft for all uses, Rainfall recharge (using Rainfall Infiltration Factor Method and Water Table Fluctuation Method), recharge due to other sources like tanks, ponds, irrigation etc are calculated using the specified norms to obtain Net Annual Groundwater Availability and Stage of Groundwater Development. Water table trend during both pre-monsoon and post-monsoon interval is plotted and categorization of sub-units is done viz. ‘Safe’, ‘Semi-critical’, ‘Critical’ or ‘Over Exploited’ for purposes of future ground water development. The annual recharge from rainfall is 156.5 ha-m for command and 4243.98 ha-m for non-command. The stage of ground water development for command and non-command is 41.38% (Safe) and 91.15% (Critical) respectively. Total ground water resource of the study area came out to be 42988 ha-m. Therefore, GEC 2015 gives more realistic values as all the possible components such as lateral flow, interconnection between aquifers, stream flows has been considered in it.

Keywords: Groundwater, Infiltration, GEC, command, non-command, aquifer.

PCOS: A REVIEW OF THE CURRENT KNOWLEDGE

SONALI DUA, SHOBHA MEHTA

Polycystic ovarian syndrome (PCOS) is a complex condition with some psychological, reproductive and metabolic manifestations that impacts health across the lifespan. In PCOS, the hormonal imbalance affects the follicular growth, during the ovarian cycle and thus causing accumulation of small follicles in the ovaries; hence contributing to the polycystic shape of ovaries. This infertility rates with polycystic ovaries is very high. And this syndrome is also characterized by the excess release of the male hormone (androgen) which causes male pattern hair growth in women. It has become a condition of clinical and public health importance as it has become very common affecting one in every 5 women. A recent study has revealed that about 18% of women in India, mostly from the east, suffer from polycystic ovarian syndrome. Therapy should
focus on both the short and the long term basis to curb with the effects of PCOS. Although there is no particular cure but a healthy and a sensible diet along with regular physical exercise can minimize the features of this syndrome.

**TRAINING NEEDS OF YOUNG RURAL GIRLS IN SELECTED VOCATIONS**

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Training is part of human growth and development. Training refers to the coaching and learning actions which are carried on for the primary reason of serving members of a society to acquire and relate the mandatory knowledge, skill and attitudes to carry out their jobs efficiently. Training is totality of instructions, planned and directed activity to which a person is subjected to induce learning. The word ‘training’ is accepted as synonym for all form of knowledge, skills, attitudinal development which a person needs to keep pace with the accelerating developments in life. Training has become a must for all professionals to update their knowledge and skills. Recognizing the need for new skills and deficiencies in formal educational systems to meet growing demands at fast pace, training has become integral part of work life.

**REDUCING POST HARVEST HANDLING AND MAINTAINING QUALITY IN AGRICULTURAL PRODUCE MARKETING**

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A large portion of all fresh produce is lost after harvest. It is estimated that a total of 20-40% of all crops in developing countries is lost to postharvest losses. Losses are due to decay, mechanical damage and physiological disorders during harvest, storage and transport. 10-20% of the total harvest is lost each year due to improper or inefficient storage and handling, although reduction of postharvest losses represents a large business opportunity and potential for economic benefit, it is a research and development area which is receiving limited attention. Apart from downright reject of damaged fruit, which sometime reaches the retail shelves, one of the most common causes of consumer dissatisfaction is poor quality fruit at the retail store due to poor harvesting, handling, storage, and transport conditions. Bruises, excess ripeness and decay cause automatic rejection by purchasing managers at retail chains. Growers and shippers in general try to reduce postharvest losses through earlier harvesting and shipping greener fruit. Often this fruit has not reached the maturity levels necessary for good eating quality. In order to reduce the losses, the natural reaction of producers has been to harvest green, unripe fruit. This change in harvest criteria results in less losses in transit, but is a major cause of rejection by consumers, leading to sales reduction. Consumers in general dislike unripe green fruit with no taste. Eventually, the fruit is equally rejected at the display in the markets, causing lost sales. When fruits are harvested at the proper maturity, ripening systems can improve significantly the eating quality of many fruits at retail. These systems have to be well designed, managed and controlled, so that they improve fruit eating and visual quality without damaging internal quality and reducing shelf life of the produce. In summary, the combination of large losses in fruits and vegetables after harvest due to improper handling transport and storage, in the form of rejected or downgraded produce, the chronic complaints among consumers regarding poor quality, the public concern for food safety and residues especially in fresh fruit produce, point out towards a significant business opportunity.

Keywords: Fresh Produce, Quality, Post Harvest Losses, Retail Chain, Consumers

**IMPROVING SOCIOECONOMIC STATUS OF RURAL WOMEN THROUGH MUSHROOM CULTIVATION**

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Women constitute almost fifty percent of the entire population. Rural women are invisible in statistics while women are extensively involved in agricultural activities. Rural women play a crucial role in agricultural development and allied fields. For the improvement of socio economic status of rural women mushroom cultivation plays an important role. Mushroom cultivation is a women friendly profession. Mushroom growing is one agricultural activity in which rural farm women can play a pivotal role without sacrificing their household responsibilities. Mushroom cultivation is simple, low cost, and suitable for rural areas, is less labor intensive and can provide employment in both the semi-urban and rural areas. Mushroom cultivation will improve the socio-economic condition of farmers, families and solve employment problems of both literate and illiterate, especially rural women. Mushroom cultivation is environment friendly and they biosynthesize their food from agricultural crop residues, which is readily available in rural areas. Mushroom have prized as the food of God on an account...
of their nutritive value, special flavor and medicinal property which can fight against malnutrition and helps to maintain nutritional security in rural areas. Mushroom is an indoor crop, grown independent of sunlight and do not require fertile land. Hence, rural women can adopt mushroom cultivation on individual or group level and raise their income and employment opportunities which make them economically and socially empowered.

**Keywords:** Rural women, Mushroom cultivation and malnutrition.

**OBSERVATIONS ON ZOOPLANKTON COMMUNITY OF NANAK SAGAR RESERVOIR, UTTARAKHAND**

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The zooplankton density and diversity along with important physico-chemical parameters were studied on fortnightly basis from August, 2016 to March, 2017 in Nanak Sagar reservoir, Uttarakhand. Three sampling sites i.e. (A1, A2 & A3) were selected for regular sampling of zooplankton and water. The range of physico-chemical parameters i.e. water temperature, dissolved oxygen, free CO$_2$, transparency, pH, conductivity, total dissolved solid, total alkalinity, nitrate and phosphate during the study period were 16.9 to 34 $^\circ$C, 3.2 to 9.6 mgL$^{-1}$, 0 to 6 mgL$^{-1}$, 67.9 to 194 cm, 7 to 8.7, 118 to 336 μS cm$^{-1}$, 91.7 to 156 mgL$^{-1}$, 60 to 140 mgL$^{-1}$, 0.22 to 0.64 mgL$^{-1}$ and 0.043 to 0.2 mgL$^{-1}$ respectively. The zooplankton mainly consisted of Rotifera, Copepoda, Cladocera, Ostracoda and Diptera. Out of 24 genera of zooplankton, 10 were from rotifer, 6 from cladocera, 5 from copepoda, 2 from ostracoda and 1 belonged to diptera group. The average density of zooplankton was 6250 individuals L$^{-1}$, 4125 individuals L$^{-1}$ and 4000 individuals L$^{-1}$ at site A1, A2 and A3 respectively. The diversity of zooplankton showed their own maximum and minimum abundance during a particular season. The water quality parameters of Nanak Sagar reservoir reveal that the environmental conditions are good from the fisheries point of view.

**ROLE OF MASS MEDIA IN ORGANIC FARMING**

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Mass media play a vital role in educating and strengthening the farmer. Now-a-days, every household have mass media like radio, television, newspaper etc. but the coverage of agricultural related by mass media is very limited. In India, still farmers are not aware about the important of the organic farming. Organic farming aims for human welfare without harming the environment. Nowadays demand for organic products especially in developed countries has been increasing. According to APEDA (2013-14) the total area in organic farming in India is 723039 Ha. It was found that more than half i.e. 52.22% of the certified organic farmer possessed medium level of mass media exposure followed by high 28.33% and low 19.45% levels. Certified organic farmers were found to be habituated use of radio, television, newspaper, magazines etc. Hence for the promotion and development of organic farming it is necessary to strengthen the farming community towards mass media and its use in knowing farm technologies and step toward organic farming as well as sustainable farming.
zoo plankton showed their own maximum and minimum abundance during a particular season. The water quality parameters of Nanak Sagar reservoir reveal that the environmental conditions are good from the fisheries point of view.

ATTITUDE OF POST GRADUATE STUDENTS OF JUNAGADH AGRICULTURAL UNIVERSITY TOWARDS AGRICULTURAL ENTREPRENEURSHIP

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The present study was conducted to find out the attitude of post graduate students of Junagadh Agricultural University towards agricultural entrepreneurship. Locale of the study was JAU, Junagadh in Gujarat state. Data was collected from 120 students of five colleges of JAU. The students were interviewed with the well designed and pretested questionnaire. It was found that majority of the students belonged to 22-24 years of age; while 46.67 percent of post graduate students belonged to first class. It was found that maximum number of respondents had medium academic achievement and family income (Above 2 lakhs) and majority of the respondents father’s were graduate and above graduate. Study also indicated that majority of the students participated in the extracurricular activities. While, Majority (65 percent) had medium level reading habit, self-confidence, risk orientation and cosmopolitanness were found to be of medium level. The study revealed that 73.34 percent had favourable attitude towards agricultural entrepreneurship. While, 15 percent of the respondents had most favourable and only 11.66 percent of the respondents had less favourable attitude towards agricultural entrepreneurship. Practical oriented and skill based entrepreneurial activities should be imparted, training and demonstrations related to modern technology should be conducted on regular basis.

Keywords: Attitude, JAU, post graduate students, agricultural entrepreneurship.

IMPORTANCE OF SOIL HEALTH AND QUALITY AND HOW TO IT IMPROVE

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Soil health and soil quality are defined as the capacity of soil to function as a vital living system within land use boundaries. This function which sustains biological productivity of soil also maintains the quality of surrounding environment and human health. Thus the two terms are used interchangeably although it is important to distinguish that, soil quality is related to soil function, whereas soil health presents the soil as a finite non-renewable and dynamic living resource. The main role of health is soil organisms respond sensitively to land management practices and climate. They are well correlated with beneficial soil and ecosystem functions including water storage, decomposition and nutrient cycling, detoxification of toxicants, and suppression of noxious and pathogenic organisms. Soil organisms also illustrate the chain of cause and effect that links land management decisions to ultimate productivity and health of plants and animals. Healthy soils should be focused on four complementary themes: (i) mechanisms and assessment of carbon storage potential in soils across regions and systems; (ii) performance evaluation of best farming practices for soil carbon and impact on other greenhouse gases, food security, and other regulation and production services; (iii) innovation and its promotion by appropriate policies; and (iv) monitoring and estimating variations in soil carbon stock, especially at the farmer level.

Keywords: Soil health, Soil quality, Ecosystem functions

WATER SECURITY PLANNING FOR SARUA MICRO-WATERSHED, PRATAPGARH, UTTAR PRADESH USING SCS-CN METHOD

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The Study aims for water security planning using USDA Soil Conservation Services Curve Number (SCS-CN) method in Sarua watershed, located between 26°2’1” to 25°58’550”N latitude and 81°45’43”E longitude which is situated at Laxmanpur block of Pratapgarh district, Uttar Pradesh. A total of 40 single storm events were selected between the years 2005 to 2014 for the study. Antecedent moisture content (AMC) was calculated by taking preceding five days rainfall which gave three conditions AMC I, AMC II and AMC III. Weighted Curve Number (CN) for the entire selected micro-watershed was calculated based in site information of the watershed and found to be 81 for AMC II. The CN values corresponding to AMC I and AMC II were 64.16 and 90.74 respectively. The average annual runoff was estimated following Curve Number method and annual runoff was found 1902395.4 m³. The total annual water requirement by the population, livestock and crop was found 7483975.2 m³. It is observed that there is a deficit of 551576.8 m³ which is about 74% of total water requirement.
Construction of water conservation structures and community management of water resources to be encouraged for proper water security planning.

Keywords: Antecedent moisture content (AMC), Curve Number (CN)

DEVELOPMENT OF ANTIMICROBIAL FINISH USING LEMON PEELS EXTRACT
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Hygiene is a burning issue in the textile industry and consumers are very conscious of textiles which are hygienic. Being worn next to the skin and by virtue of their characteristics, textiles provide an excellent medium for the adherence, transfer and propagation of infection causing microbial species. Microbial action is a dominant factor in limiting the performance of the textiles. The detrimental effect of microbes can be seen on both the wearer and fabric. Several challenges have been created for textile researcher to develop special finishes to make fabric microbial resistant especially cotton being most demanded and usable fabric, but, susceptible to more microbial growth. Therefore, textile finishes with added value particularly for medical clothes are greatly appreciated and there is an increasing demand on global scale for these type of textiles. Hence, the use of non-toxic and eco-friendly anti-microbial textiles have become a matter of significant importance because of the increased awareness in order to avoid some hazardous synthetic anti-microbials. Although, many natural anti-bacterial agents are available at present, only few studies have been explored for their anti-bacterial activity on textile materials. Also, by considering the health problems faced by the consumers as well as understanding the importance of cotton in our life, the study on application of lemon peel for microbial resistance on cotton fabric was conducted. Anti-bacterial finish was applied on cotton fabric with lemon peels extract. Finish was applied on the fabric by method exhaust method. The percent reduction in bacterial growth was decreased with increase in incubation period after application of the lemon peels extract finish. Hence, lemon peels finished samples exhibited very good resistance against the growth of Bacillus spp. So, the textiles with anti-microbial finish not only protect the fabric, but also the user, from microbial infestation.


INNOVATIONS IN NATURAL COLOR EXTRACTION TECHNIQUES IN FOOD INDUSTRY
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Food pigments are compounds which are responsible for the color of edible products. The major natural pigment types comprises of the heme pigments (Mb and Hb), carotenoids, chlorophylls, anthocyanins, flavonoids, betalains, melalin, tannins, quinones, and xanthones. These natural compounds are widespread in animals, plants, and microorganisms (including algae, fungi, and yeasts). The use of natural pigments for food coloring is receiving growing interest from both food manufacturers as well as consumers because of innumerable associated benefits and myriad therapeutic properties which are linked with the use of natural colorants in food industry. Extraction and purification of these compounds is one of the key processing steps in recovering the major ingredients contained in plant-based materials. Solvent extraction is the conventional method that is usually followed to extract colors from plant materials. Though the existing conventional extraction methods has more extractability than commercial methods, it also passes serious limitations and environmental issues, which gave rise to new novel “Green” extraction technology having potential to overcome all limitations of present technologies. The current advance techniques that are followed in color extraction are as follows: i. High Hydrostatic Pressure (HHP), ii. Pulsed Electric Field (PEF), iii. Sonication-assisted Extraction, iv. Gamma Irradiation, v. Enzymatic Extraction, vi. Membrane Technology.

Keywords: Natural colors, Green extraction techniques, Health benefits, Food industry

MNREGA: CONSTRAINTS OF WOMEN EMPOWERMENT IN PURABAZAR BLOCK OF FAIZABAD DISTRICT, UTTAR PRADESH
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The present research was conducted in Purabazar block of Faizabad district of Uttar Pradesh. To assess the impact of MNREGA on women empowerment. The data was collected through personal interview with help of interview schedule. The data finalized, tabulated and find out the percentage. It was observed that the entire MNREGA job holder belongs to below poverty line. The general constraints regarding of women empowerment, were 60:40 wage and material ratios is not maintained it was ranked first, constraints regarding, selection and registration, “Job cards are issued less in comparison to...
Tourism is increasingly being adopted and is suggested to bring a myriad of economic and intrinsic benefits to farmers, strengthening linkages with local communities. Diversifying a farm to include recreation and leisure activities into agro-investments leading to energy and water efficiency, waste reduction, biodiversity and cultural heritage conservation, and the environment, surrounded by magnificent landscape. Agro-tourism can contribute towards a green economy transition through contact with the rural life, taste the local genuine food and get familiar with the various farming tasks. It also provides the opportunity to experience the real enchanting and authentic employment. It is thus capable of offering a wide variety of entertainment for the discerning tourists and has the capacity to attract visitors from around the world.

India has a thriving tourism industry, which contributes over 6% to the national GDP and 8% of the total revenue. India exhibits diverse form of art and culture entrenched through a rich heritage, which makes India a hot global tourist destination. India has a thriving tourism industry, which contributes over 6% to the national GDP and 8% of the total employment. It is thus capable of offering a wide variety of entertainment for the discerning tourists and has the capacity to diversify into new arena of agro-tourism. Agro-tourism offers an opportunity to experience the real enchanting and authentic contact with the rural life, taste the local genuine food and get familiar with the various farming tasks. It also provides the welcome escape from the daily hectic life in the peaceful rural environment and to relax and revitalize in the pure natural environment, surrounded by magnificent landscape. Agro-tourism can contribute towards a green economy transition through investments leading to energy and water efficiency, waste reduction, biodiversity and cultural heritage conservation, and the strengthening of linkages with local communities. Diversifying a farm to include recreation and leisure activities into agro-tourism is increasingly being adopted and is suggested to bring a myriad of economic and intrinsic benefits to farmers.
visitors and communities. Agro-tourism promises the benefits of keeping family farms in business and preserving agricultural heritage, maximizing the productivity of farmland resources through their recreational use, and even improving the economic situation of local communities. For most people, agricultural tourism refers to a visit to a working farm or any agricultural, horticultural, or agribusiness operation in order to enjoy, be educated by, or become actively involved in the activities of the farm or operation – in other words, getting a true farm experience. The Indian farming industry is facing decreasing profitability because of declining returns to production agriculture. The future sustainability of many farm operations is linked to the ability of farmers to generate supplemental income from existing farm resources. Agro-tourism is a strategy to promote agricultural economic development in India. Through this paper it is intended to inform policy makers and farmers about the nature of agro-tourism activities and the extent to which these activities enhance agricultural viability.

Keywords: Agriculture, Agro-tourism, Sustainable tourism, Rural tourism

MORPHOMETRIC ANALYSIS OF KOYNA RIVER BASIN USING REMOTE SENSING AND GIS TECHNIQUES
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For better watershed management in the river basin the characteristics of different morphometric parameter must be known. Morphometry includes the measurement and analysis of earth’s form, surface, features and landform dimensions. The aim of this study is to identify morphometric characteristics of Koyna river basin which is an important tributary of Krishna river situated in Western Ghats region of Maharashtra state, India by using remote sensing and GIS technology. In this study different linear, areal and relief aspect of the Koyna river basin are analyzed. The morphometric analysis showed that the trunk order of the basin is sixth order. Dendritic and trellis drainage pattern is observed in the basin. Low mean bifurcation ratio indicates structurally less disturbed drainage network and relatively homogeneous lithology. The form factor, shape factor, circulatory ratio and compactness coefficient revealed that the basin is elongated one. Drainage density of basin is very coarser indicating permeable substrata, low relief and thick vegetation. Infiltration number indicates low runoff and more infiltration in the basin. Low stream frequency represents high permeability, low relief and maximum areal coverage by forest in the basin. Overland flow length in the basin is more due to higher infiltration rate of soil; it causes low catchment response to runoff. The high value of constant of channel maintenance indicates strong lithology, high permeability, high vegetative cover, low erodibility and low runoff from the basin; hence flood hydrograph will have flatter peak and longer base width. Relief ratio showed low to moderate slope of basin which is least susceptible to erosion process. Ruggedness number indicated that the basin has extreme roughness and unevenness; hence in the basin still the soil erosion process is in active nature.

HYDROCOLLOID AS FOOD
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Hydrocolloids are widely used in the food industry as gelling, stabilizing, thickening and suspending agents. These are polysaccharides composed of simple sugar building units and all of them have hydrophilic molecules, which combine with water to form viscous solutions. Hydrocolloids can be added to increase the consistency of the ketchup at lower total solids content. Hydrocolloids have been used since at least as far back in time as ancient Egypt and have been part of the human diet for several thousand years. They are produced from seeds, roots, red and brown seaweed extracts, tree sap, fruit peels, and animal extracts. There are microbiological hydrocolloids which are produced by the fermentation of bacteria; like Xantham and gellan gums, and there are also cellulose derivatives, like methylcellulose. The hydrocolloid could provide extra body and mouth feel to a beverage or give a gel structure to a milk-based product, like a pudding. To stabilize a food product, refers to the prevention of physical changes in the product resulting from the separation of its components, for
example; a vinaigrette or salad dressing. Also, the handling and processing conditions of a product, such as high temperatures, can prevent a pie filling from melting and running when subjected to the heat of an oven. Hydrocolloids added to various food systems can influence the texture, increase the stability and reduce fat or calories in a food product.

POTENT WILD EDIBLE FRUIT PLANTS FOR NUTRITION AND HEALTH FROM BAHRAICH (UP) INDIA

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Collection of fruits from wild for food and domesticating food plants for multipurpose use is an age-old practice in Indian subcontinent. Mango, bael, aonla, banana, palmyra palm, coconut and such others are intimately associated with the culture, traditions, festivities and rituals of Indian communities. Medicinal uses of fruits like bael, emblic myrobalan, jackfruit, wild dates, wild fig, monkey jack, jamun, ber, mango, wood apple and many others find place in Indian Ayurvedic literature starting from the century BC to the date. The rich diversity of wild fruits in Indian tropics and Himalayan belt not only provide nutritious food, but also income to tribal and poor people living close to forests and rural areas. Quite often, besides providing timber, firewood, fodder, they serve as famine insurance in periods of food scarcity. Many of the wild fruits are nutritionally very rich and of great medicinal value. Agricultural research and development however have not given due emphasis to these plant groups resulting limited literature on diversity, distribution, taxonomy, phenology and uses of wild edible fruit plants of India. An inadequate understanding concerning taxonomy, biology and local knowledge of these taxa has contributed to suboptimal utilisation of these valuable resources. It is essential therefore, to identify, evaluate, improve, propagate and cultivate these under-utilized species for its sustainable use which can broaden our choice of food and enrich the livelihoods of rural poor. In Bahraich there are 76 wild edible plant species representing 63 genera of 40 families. Moraceae and Anacardiaceae are found to be the biggest family represented by 5 plant species each whereas Malvaceae and Rhamnaceae with 4 plant species each; Rutaceae, Annonaceae, Euphorbiaceae, Sapotaceae, Solanaceae and Myrtaceae with 3 plant species each; Amaranthaceae, Vitaceae, Caesalpinaceae, Lamiaceae, Capparaceae, Apocynaceae, Boraginaceae, Dilleniaceae, Sapindaceae, Rubiaceae and Combretaceae with 2 plant species each. The rest 19 families viz., Cornaceae, Phyllanthaceae, Averrhoaceae, Nyctaginaceae, Bombacaceae, Lecythidaceae, Ebenaceae, Asteraeae, Flacourtiaceae, Molluginaceae, Acanthaceae, Lauraceae, Passifloraceae, Arecaeae, Portulacaceae, Aizoaceae, and Papilionoideae are being represented by single plant species each.

PERSPECTIVE OF AGRICULTURE GIRL STUDENTS TOWARDS HIGHER EDUCATION

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Higher education plays an immense role in inspiring students to realize their goals and achieve it. This fact has been realized by many girl students pursuing their studies in various courses of agriculture. The perspective of these girl students towards higher education plays a significant role in the development process of agriculture. Nowadays more number of girl students are seeking admission in various agriculture universities for acquiring higher education. The women agricultural research scholars are considered as important element in carrying out research on the agriculture and acquiring better position in agricultural occupation. The girl students obtaining higher education in agriculture faculty play a significant role in rural development and in enhancing national economy. There are several reasons behind the girl students opting higher education and some of them are; they want to establish themselves really well in the society, desire to ensure equal participation in the development process, need to be economically independent, desire to achieve their goals and fulfill their dreams, to obtain more equitable status, want to become an asset for their families, desire to take their own decisions, want to take the family responsibilities, desire to have better recognition and prestige in the society, desire to get better job opportunities, etc. They have perceived pretty well that the above needs and desires can only be fulfilled if they are highly qualified. Hence, maximum number of girls are having a positive attitude towards pursuing higher education. This optimistic attitude of girl students is playing a crucial role in expansion of agriculture.
INTEGRATED FISH FARMING TECHNOLOGY: WAY TOWARDS SOCIO-ECONOMIC UPLIFTFMENT AND WOMEN EMPOWERMENT IN RURAL AREAS OF WEST KAMENG DISTRICT ARUNACHAL PRADESH, N. E. R. INDIA

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In India more than 75% of the total population, involves in agriculture / allied sectors and lives in rural areas at subsistence or near subsistence level. These rural folk are greatly under-nourished, requires not only a large supplement of animal protein in their diet but also new sources of gainful employment for their socio-economic upliftment. In this reference Integrated Fish Farming may become a one of the best examples of mixed farming for sustainable development of the rural farming community. This type of farming practices in different forms in the various countries is one of the important ecological balanced sustainable technologies. The systems gives a good returns to the farmers in term of fish production, a handsome quantity of other agri./allied products and may become new sources of gainful employment for their overall development. In view of the above facts the present study were undertaken in the three villages i.e. Sangti, Chug and Salari of Dirang Circle during the year 2016-17 under West Kameng district of Arunachal Pradesh through the involvement of women farming community, as they plays an important and major role at household level for the upliftment of their family socioeconomic status. This district is lying approximately between 91° 30’ to 92°40’ East longitudes and 26° 54’ to 28° 01’ North latitudes, blessed with complex climatic environmental conditions having foothill as well as complex hill eco-system with the varying elevation ranging about from 300-4200 meter and covers about 7422 Sq.KM of geographical region accounting for 8.86% of the total area of the state. During the experimental period the observations were made periodically on monthly basis from each segment and data were analyzed for the proper evaluation of the system. The encouraging results were recorded from this system (IFS) in comparison to mono-cropping pattern of farming. On the agricultural front, the district is still at the stage of subsistence level of farming in this context Integrated Fish Farming may become a one of the best examples of mixed farming for sustainable development of the rural farming community through conservation and efficient utilization of their natural resources.

Keywords: Integrated Farming, ecologically balanced, socioeconomic and sustainable etc.

HEAVY METALS IN COSMETICS: DISTRIBUTION AND POSSIBLE HARMFUL EFFECTS ON HUMAN

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During the last few decades cosmetic products have a big boost and applied to the human body for beautification. The cosmetic products include, care creams, talcum, face powder, lipstick, kajal, sindoor and eye makeup etc. There are concerns regarding the presence of harmful chemicals such as heavy metals in these products. These heavy metals can cause or are supposed to cause harmful effects such as cancer, allergic reactions, mutations, respiratory problems as well as development and reproductive problems. Dermal exposure is expected to be the most significant route because most of the cosmetics are directly applied to the skin. Oral exposure can occur from applying cosmetics around the mouth and also from hand to mouth contact. These metals bind with protein sites which are not made for them by displacing original metals from their natural binding sites causing malfunctioning of cells and ultimately toxicity. Previous research has found that oxidative deterioration of biological macromolecules is primarily due to binding of heavy metals to the DNA and nuclear proteins. Lead can substitute calcium even in picomolar concentration affecting protein kinase C, which regulates neural excitation and memory storage. Because of mutagenic properties of Cr (VI), it is categorized as a human carcinogen by the International Agency for
the Research on Cancer. In humans Mg$^{2+}$ and Fe$^{3+}$ are replaced by Al$^{3+}$, which causes many disturbances associated with intercellular communication, cellular growth, secretory functions and neurotoxicity. The iron produced hydrogen free radicals and those attack DNA, resulting in cellular damage, mutation and malignant transformations which in turn cause an array of diseases.

AN ANALYSIS OF CROPPING PATTERN IN MALAPRABHA PROJECT COMMAND AREA
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Analysis of cropping pattern in a region is of vital importance and it helps to decide which is the best suitable crop for particular geographical area. The present study was taken up in Malaprabha Project Zone (MPZ), Karnataka. It aimed at analyzing the cropping pattern prevailing in the study area and also comparing the recommended cropping pattern with the actual practice and identify the deviation. The study made use of both primary and secondary data for analyses. Primary data was collected from farmer respondents of villages in Head and Tail regions of Malaprabha Left Bank Canal (MLBC). Secondary data was collected from Department of Agriculture, Malaprabha Project Zone (MPZ). Markov Chain Analysis was used to analyze the time series data on area coverage of different crops grown in Malaprabha Project command area from 1999-2015 and simple tabular analysis was used to analyze the primary data. The results revealed that maize was the major cereal crop, pigeon pea, green gram and bengal gram were the major pulse crops. Ground nut and sunflower were the major oil seed crops. Vegetables were grown in summer and sugarcane, cotton and chilly were the major annual/bi seasonal crops grown by the sample farmers in the command area. It was also observed that cotton, maize and groundnut were predominantly and farmers deviated from the recommended cropping pattern by Command Area Development Authority (CADA).

Keywords: Cropping pattern, CADA and command area.

ROLE OF WOMEN IN SERICULTURE
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Sericulture is essentially a village based industry that provides employment to both skilled and unskilled labour, women and aged persons at homes at minimum risk. India continues to the second largest producer of silk in the world and has 16.58% share in global raw silk production. Among the four varieties of silk produced as in 2016-17 the production increased up to 30265 MT. The employment generation in the country is raised to 8.51 million persons in 2016-17 compared to 7.65 million persons in 2012-13. The present article will mainly explore the role of women in sericulture and includes the concept of work, division of labour, segregation of occupations, and dimension of labour and household activities. This article will further discuss the preparation of women toward silkworm, feeding and so on. Women are mostly favoured because of their industrious nature. They are employed in a mulberry garden or silkworm rearing or in a grainage. Coming to the post cocoon technology, the involvement of the women is greater, commencing from silk reeling, weaving and garment manufacturing industry. However, their work has not always been properly recognized or suitably rewarded. Thus the analysis clearly establishes the importance of sericulture over other crops in the generation of fresh employment opportunities in rural areas.

KEY WORDS—Women, Sericulture, employment, tribal, income.

RURAL LIVELIHOOD AND DEVELOPMENT IN ALLIED SECTOR ROLES, INTER- LINKAGES AND SIGNIFICANCE OF NON- FARM SECTORS IN BOOSTING RURAL ECONOMY OF INDIA: DOUBLING THE FARMER’S INCOME
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Importance of rural non- farm economy: The rural non-farm economy comprises all the non-agricultural activities which produce income to rural households (including income in-kind and remittances), either through waged work or in self-employment. The rural non-farm economy has interest of governments, non-governmental organisations (NGOs), bilateral and multilateral donor agencies as well as development practitioners due to its prevalence in both developing as well as transition economies. This economy is mostly small-scale which uses little capital, and has low productivity thus offers low returns, and activities which operate at larger scale with higher capital investment are found less prevalent (Davis, 2003). Driving factors for rural non- farm sectors: Distress-push diversification drives the majority of the rural poor into rural non-
farm employment and income generating activities (Bezemer and Davis, 2003). It has importance for policymakers to distinguish between distress-push and demand-pull since each may require different policy responses (Davis and Pearce 2001). The former requires policymakers to develop apt social safety net and interventionist policies to alleviate the short-run negative effects that from time to time accompany this type of diversification (for example, over-rapid urbanisation, negative environmental impacts etc.). Where demand-pull factors drive the process of diversification, thus policy-makers seek to deliver a suitable “enabling environment” to support the development of the rural non-farm economic activities and sustainable rural livelihoods. Tool and linkages for poverty alleviation: In transforming countries like most of Asia, the Middle East and North Africa and Central Asia, economic growth is fast in other sectors but a large number of the poor remain in rural areas. Growth in agriculture and in the associated rural non-farm economy is needed to reduce poverty and confine rising rural-urban income disparities (Davis, 2003). As agriculture grows, it stimulates growth of the rural non- farm sector through a number of key linkages such as rise of labour productivity on the farm which increases food supplies and provides scope for farm family workers to undertake non-farm activities, Increases in farm incomes through with high rural savings rates and ensuring capital availability for investment in non-farm activities. As the rural incomes increases, farm households spend much of their obtained income on wide range of consumer goods and non-farm services. Diversification of rural economy: The barrier to structural transformation and poverty eradication in rural area is the incongruity between the need for diversification of income and the opportunity to diversify, at the household and the community level among youth. It can be said “meso-paradox” at the level of community (Reardon, Berdegué and Escobar, 2001). Conclusion: There is urgent need to double the farm income of farmers with the present condition aim at advancement with sustainability by means of rural non- farm activities. The rural non-farm economy should be boosted to be the main alternative in the absence of proper agricultural wage labour market. Sustainability could be ensured by analysing forward-looking and speculative indicators rather than only objective indicators. Comparative analyses of different case study experiences should be promoted.

Keywords: Income, economy, sustainability, non-farm activities, diversification.

IMPACT OF ASCI IN AGRICULTURE AND ALLIED INDUSTRIES

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Agriculture Skill Council of India – ASCI was formed in 2013 as the 13th sector skill council to address the end-to-end skilling needs in a sector that employs more than 50% of the workforce. Though there are large numbers of people engaged in agriculture, the actual number of people actively involved is on the decline, apparently from 250 million to 119 million over next 7 years. This makes imperative to look into the need for training, productivity enhancement and better outcomes. They have trained 1,37,000 under the PMKVY scheme and another 23,000 people through RPL for PMKVY. They have developed 168 Qualification Packs (QPs) for various job roles covering agriculture, horticulture, diary, poultry, fishery, apiculture, agro forestry, water management, post-harvest (agri-supply cold chain). Besides the flagship programs of central government, They are also engaged with the state skill missions which include UP Skill Development Mission, Kerala, Himachal Pradesh State Skill Mission, MoU with West Bengal and Rajasthan – through training and certification. Agriculture is being introduced as a vocational subject from standard 9 to 12 in 533 different schools across 5 states under Rashtriya Madhyamik Siksha Abhiyan (RMSA) Program. Vocational programs are being run in 50 community colleges where agriculture programs are taken in at various levels like certificate, diploma and advanced diploma. When they started their journey, they didn’t have trained trainers, now they have almost 700+ trained trainers, 600 assessors as well. They are operating in all the 29 states in India and also conduct assessments in 11 regional languages. First, they developed the QPs, now they have their model curriculum and they have reached the third stage of developing their training content.

Keywords: PMKVY, Skill Development

ADOPTION OF FARMERS ABOUT IMPROVED GINGER (ZINGIBER OFFICINALE L.) PRODUCTION TECHNOLOGY IN UDAIPUR DISTRICT OF RAJASTHAN

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Ginger is an important spice and medicinal crop. The present study was conducted in Udaipur district of Rajasthan. There are total eleven tehsils in Udaipur district, out of which two tehsils namely, Jhadol and Gogunda were selected on the basis of maximum area under ginger cultivation. Five villages from each identified tehsil were selected on the basis of maximum area under ginger cultivation. For selection of respondents, 100 ginger growers were randomly selected from identified villages (10 from each village) for data collection. The study revealed that 57.00% respondents fell in medium level of adoption group whereas, 16.00 % ginger growers were observed in the high level adoption group and remaining (27.00%) respondents
were possessed low level of adoption about improved ginger production technology. The study indicated that farmers had adequate adoption regarding recommended time of sowing, harvesting at proper time, follow the recommended irrigation management practices and recommended seed rate, where as they had less adoption regarding recommended seed treatment, adoption of scientific curing process, use of high yielding varieties, and recommended insecticides.

**Keywords:** Spice, Ginger, Adoption, Production, Technology

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**EFFECT OF PRESERVATION TECHNIQUES ON FOOD QUALITY**

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The preservation is very effective term, because this term protects the food and food materials for longer time periods. In many years ago food is being stored in houses for the purpose of emergency. In addition to basic food items, people also store frozen or preserved garden-grown fruits, vegetables and freeze-dried or canned produce. Food preservation has long been an on-going challenge for human with the methods like, drying, salting and fermentation being traditionally done for preservation. Methods such as canning, freezing and irradiation are relatively recent developments and adopted for preservation of food. Quality and shelf life of food products depend greatly on the properties of microorganisms contaminating the food. The preservation techniques would retain the nutritional quality of food including vitamins, minerals, and essential flavors. There are many processes used for making foods stable and safe, e.g. heating, chilling, freezing, freeze drying, drying, curing, salting, sugar-addition, acidification, fermentation, smoking or oxygen removal. However, these many processes are based on relatively few parameters or hurdles, i.e. high temperature (F value), low temperature (t value), pH, preservatives, and competitive flora. Food preservation is viewed as a 'convenience' of an efficient food system as well as a key to ensuring the availability of food as a vital benefit, particularly in developing countries.

**Keywords:** Food, Preservation Techniques

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**STUDY OF ANTI-INFLAMMATORY ACTIVITY OF SOME SUBSTITUTED CHROMONES**

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Heterocyclic compounds like thiazole acetic acids and pyrazole derivatives phenylbutazone and oxyphenylbutazone (Tanderil) are good anti-rheumatic factors. Though oxyphenylbutazone is less toxic than phenylbutazone, but still there is need for better alternatives. Hence, thiazole ring was created on chromone nucleus and other heterocyclic systems were developed on thiazole ring of thiazolylchromones with a view to study their anti-inflammatory activity and establish structure activity relationship (SAR). This paper studies SAR in them. Among these compounds 3-[2-(morpholinyl)thiazol-4-yl]-6-chloro-2-methylchromone [1] and 6-(2-methylaminothiazol-4-yl)-2,3-dimethylchromone [2] have shown good anti-inflammatory activities equal to 49 and 47 as compared to 53 for phenylbutazone standard. It is important to mention here that chromone ring is comparatively safer moiety as it is present in a number of fruits, vegetables and plants. Their safer nature is also evident by their ALD50 values.

**Keywords:** Substituted chromones, thiazoles, pyrazoles, anti-inflammatory activity.

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**INDIAN DAIRY INDUSTRY**

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India is the world’s largest producer of dairy products by volume, accounting for more than 13% of world’s total milk production, and it also has the world’s largest dairy herd. As the country consumes almost all of its own milk production, India was neither an active importer nor an exporter of dairy products prior to year 2000. However, since the implementation of Operation Flood Programme, the situation changed significantly and imports of dairy products reduced to very small quantities. From 2001, India has become a net exporter of dairy products and after 2003 India’s dairy import has dipped while exports have increased at a fast rate. Yet the country’s share in global dairy trade still remains at minor levels of 0.3 and 0.4 percent for exports and imports respectively. This is due to the direct consumption of liquid milk by the producer households as well as the demand for processed dairy products that has increased with the growth of income levels, which have left little dairy surpluses for export. Nevertheless, India consistently exports specialty products such as casein for food processing or pharmaceuticals. The Indian dairy sector is also different from other dairy producing countries as India places its emphasis on both cattle and buffalo milk. In 2010, the government and the National Dairy Development Board have...
drawn up a National Dairy Plan (NDP) that proposes to nearly double India’s milk production by 2020. This plan will endeavour to increase the country’s milk productivity, improve access to quality feeds and improve farmer access to the organized market. These goals will be achieved through activities that focus on increasing cooperative membership and growing the network of milk collection facilities throughout India.

Keywords: India, Dairy Industry and Milk

PROFILE CHARACTERISTICS OF ARECANUT GROWERS OF UTTARA KANNADA DISTRICT
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The present study was conducted during 2015-16 in Uttara Kannada district of Karnataka. Sirsi, Siddapur and Yellapur talukas of Uttara Kannada District were selected for the study in the view of their highest share in area and the production in the district. The total sample size was 180. The ex-post-facto research design was used for the study. Age education, land holding, area under arecanut, experience in arecanut cultivation, family size, annual income, extension contact, mass media exposure, economic motivation, scientific orientation, production orientation and market orientation are the personal and socio-economic characteristics of arecanut growers. Arecanut growers had medium level of extension contact (40.56%), mass media exposure (47.78%), economic motivation (46.11%), scientific orientation (39.44%), production orientation (43.33%), market orientation (44.44%), material possession (42.22%) and organisation participation (44.44%).

Keywords: National Income, Beetle nut, Gross National Product

IMPACT OF FOOD WASTAGE ON CARBON FOOT PRINT
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Global food production must increase by 60% by 2050 in order to meet the demands of the growing world population. Yet, more than one third of the food produced today is lost or wasted. Food loss refers to the decrease in edible food mass at the production, post-harvest and processing stages of the food chain, mostly in developing countries. Food waste refers to the discard of edible foods at the retail and consumer levels, mostly in developed countries. This food wastage represents a missed opportunity to improve food security and comes at a steep environmental price. One third of the food produced in the world for human consumption, every year approximately 1.3 billion tonnes gets lost or wasted. Food waste isn't just a devastating misuse of natural resources, it's also a huge part of the world's carbon footprint. A product's carbon footprint is the total amount of greenhouse gases (GHGs) it emits throughout its life cycle, expressed in kilograms of CO2 equivalents. This includes the GHG emissions during the agricultural phase, including those from on-farm energy use and non-energy-related emissions (such as CH4 and N2O) from soils and livestock. On a global average, per capita food wastage footprint on climate in high income countries is more than double that of low income countries, due to wasteful food distribution and consumption patterns in high income countries. Global food loss and waste generate annually about 8% of total anthropogenic GHG emissions. This means that the contribution of food wastage emissions to global warming is almost equivalent (87%) to global road transport emissions. Strengthening the supply chain through the direct support of farmers and investments in infrastructure, transportation, as well as in an expansion of the food and packaging industry could help to reduce the amount of food loss and waste.

Keyword: food loss, food waste, carbon foot print, foot wastage.

CONTRACT FARMING-PROSPECTS AND CHALLENGES IN INDIA
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India is a country where agriculture is an age old practice and back bone of the country. Nearly agriculture contributes 17-18 percent to the country’s GDP. In India most of the farmer’s are small and marginal farmer’s and get lots of troubles at the time of capital requirement. Contract farming has been existing in India since many years. It is the agreement between the farmer’s and the company for the production of quality agriculture produces. It also helps the farmer’s in increasing their income levels, produce high quality products, gain high price than normal price. Increase in agriculture standards also indirectly helpful for the country’s GDP. Contract farming is being done in agriculture sector and its allied sectors like dairy, aquaculture etc. Thus contract farming is the viable option for the development of agriculture in India and raises the standards.
of farmer’s also. Different models and problems of the contract farming from both sides that is farmer as well as company will be discussed in this paper.

Keywords:- Agriculture, Contract Farming, Pre-Arrangements, Increasing income, Challenges, Suggestions.

RURAL YOUTH EMPOWERMENT OF INDIA THROUGH USE OF ICT
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Integrating Information Communication Technology (ICT) with agriculture is identified in order as agriculture is an important sector with more than 70% of the Indian population living in rural areas and earns its live hood by agriculture. The sector faces major challenges of enhancing production in a situation of dwindling natural resources necessary for production. The growing demand for agricultural products, improve rural livelihoods. ICT has become one of the basic building blocks of modern society. India has the largest population of youth in the entire world 66 per cent of the total population in the country is below the age of 35. Young people who are given early access to ICT tend to become early adopters and adapters of the technologies, skills valued for spurring innovation and economic growth. ICT initiatives in rural India emphasize the use of a more systematic approach for linking traditional knowledge systems (TKS) & ICT to ensure sustainability of rural e-governance. To empower poor people and to reduce digital divide, ICTs projects should be developed in local language prioritizing local needs and content; be a model of low cost solution so that poor people can replicate this model or can own or share the system, be able to adopt and utilize innovative ICTs; A national agenda on a C-8 thrust towards: Connectivity, provision, Content creation, Capacity augmentation, Core technologies’ Creation, Cost reduction, Competence building, Community participation and Commitment. The ICT tools can change the ideas, activities and can adopt appropriate measures at the time of need. ICT has great relevance in today’s world. With the IT boom in India technology is easily accessible to the government machineries with relevantly cheaper and convenient manner. Proper training and implementation of ICT programmes in simple way and language which is easily understandable by the rural people can surely bring about revolution in rural development.

Keywords: ICT, Traditional knowledge systems

SOCIO-ECONOMIC STATUS OF BT COTTON’S FARMER IN INDIA
YOGESH KUMAR, NAVNEET KUMAR SINGH, VIVEK PRATAP SINGH

Bt or Bacillus thuringiensis is a soil bacterium which contains a toxic gene called Bt gene what makes the cotton crop resistant against bollworm. Therefore genetic engineering plays an important role in inserting a gene into the cotton-seed. It has been commercialized in a number of countries, including the United States, Australia, China, Mexico, Argentina, South Africa, and India. The country with the highest area under transgenic crops, at 75 Mha, is the USA. Bt cotton was first approved in India in 2002. India has the world’s fourth-largest cultivated area under genetically modified (GM) crops after USA, Brazil, and Argentina. Significantly, the entire 11.57 Mha GM crop area in India under Bt cotton and nearly 96 percent of the country’s cotton area is now covered by Bt hybrids. There is a number of problems which are faced by Indian Bt cotton’s farmers, such as, there are also reports claiming genetically modified (GM) crops in general and Bt cotton in particular, are unsuitable for developing countries, causing negative impacts on small farm sector. India takes an influential position in cotton growing countries where the crop is mostly cultivated by smallholder farmers. Another problem is that, the Bt cotton was developed for cold temperate countries but India has a hot climate. In India, subsidies are so tiny that the risk-taking capacity of farmers is insubstantial. Indian farmers also faced lots of problems against agricultural and climatic conditions. There are many kinds of cotton pests in India apart from the bollworm. In tropical countries, pest attack is far more intense and the number of insects per acre. Another problem is that insects develop resistance quite fast against Bt toxicity. Apart from this, Bt cotton also contains a number of advantages. Bt cotton improves the income of farmers because it increases the yield of cotton due to effective control of bollworms and reduction in insecticides used in the cultivation of Bt cotton. It also fixed a potential reduction in the cost of cultivation due to low or no use of insecticides, Bt cotton plays a vital role in diminishing health hazards due to rare use of insecticides.

Keywords: Bt cotton, Bacillus thuringiensis, Bollworm, Transgenic crops, Genetically modified.

AGROBUSINESS IN INDIA: SCOPE, OPPORTUNITIES AND CHALLENGES
YUDHISHTHER SINGH BAGAL*, RAKESH NANDA AND RASHIKA MAHAJAN

Bt hybrids. There is a number of problems which are faced by Indian Bt cotton’s farmers, such as, there are also reports claiming genetically modified (GM) crops in general and Bt cotton in particular, are unsuitable for developing countries, causing negative impacts on small farm sector. India takes an influential position in cotton growing countries where the crop is mostly cultivated by smallholder farmers. Another problem is that, the Bt cotton was developed for cold temperate countries but India has a hot climate. In India, subsidies are so tiny that the risk-taking capacity of farmers is insubstantial. Indian farmers also faced lots of problems against agricultural and climatic conditions. There are many kinds of cotton pests in India apart from the bollworm. In tropical countries, pest attack is far more intense and the number of insects per acre. Another problem is that insects develop resistance quite fast against Bt toxicity. Apart from this, Bt cotton also contains a number of advantages. Bt cotton improves the income of farmers because it increases the yield of cotton due to effective control of bollworms and reduction in insecticides used in the cultivation of Bt cotton. It also fixed a potential reduction in the cost of cultivation due to low or no use of insecticides, Bt cotton plays a vital role in diminishing health hazards due to rare use of insecticides.

Keywords: Bt cotton, Bacillus thuringiensis, Bollworm, Transgenic crops, Genetically modified.
In developing countries like India, the agribusiness sector consists of four distinct sub-sectors, viz. agricultural inputs; agricultural production; agro-processing; and marketing and trade. There is a need to shift from ‘agriculture’ to ‘agribusiness’, as it is being viewed as an essential pathway to revitalize Indian agriculture. Over the years, while the agricultural marketing and trade scenario has undergone tremendous changes. This helps in increasing the incomes of farmers, saving the national loss of farm products along the traditional supply chain and makes a valuable contribution in terms of creating additional employment in the non-farm sector. Sound development of agribusiness provides a new frontier by creating an environment of much needed investment in agricultural marketing and trade. For improving the efficiency of the agricultural marketing system, there is a need of substantial investment in marketing infrastructure, both physical and institutional. Several initiatives have been taken during the past ten years, which have created a favourable environment for the growth of agribusiness. Keeping this in view the government has set up several agri export zones (AEZs) for agri-exports. It improves quality of services to the consumers and creates employment for the youth. It also helps in achieving international quality standards and thus boost exports, leading to increase in farmers’ incomes. However some of the constraints and challenges are observed towards practicing agribusiness. In order to overcome such constraints and challenges are observed towards practicing agribusiness, some of the suggestions can be considered like by giving priority in the investment in agro business giving more focus on area expansion in cultivation, crop production and processing.
Next Announcement

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