



# कृषिवानिकी Agroforestry



समाचार पत्र  
Newsletter

राष्ट्रीय कृषिवानिकी अनुसंधान केन्द्र, झाँसी-284003 (उ.प्र.)  
National Research Centre for Agroforestry, Jhansi-284003 (U.P.)

अप्रैल-जून, 2004  
अंक 16, संख्या 2

April-June, 2004  
Vol. 16, No. 2

## राष्ट्रीय कृषिवानिकी अनुसंधान केन्द्र में लोकल एरिया नेटवर्क की स्थापना

लोकल एरिया नेटवर्क (लैन) किसी एक संस्था द्वारा उपयोग में लाया जाने वाला सीमित दूरी का ऐसा संचार नेटवर्क है, जिसके द्वारा प्रयोगकर्ता सूचना एवं अन्य स्रोतों का आदान-प्रदान कर सकता है। लोकल एरिया नेटवर्क में प्रत्येक माइक्रोकम्प्यूटर केबल के माध्यम से एक केन्द्रीय कम्प्यूटर (सर्वर) से जुड़े होते हैं। इस सर्वर की हार्डडिस्क में एक नेटवर्क सॉफ्टवेयर होता है। जो कि डाटा, एप्लीकेशन प्रोग्रामों और दूसरे स्रोतों के आदान-प्रदान में सहायक होता है। लोकल एरिया नेटवर्क को विभिन्न नेटवर्क टोपोलॉजी जैसे बस, स्टार और रिंग के रूप में स्थापित किया जा सकता है।

लोकल एरिया नेटवर्क के लिए आवश्यक चीजें :

1. नेटवर्क सर्वर (सेंट्रल कम्प्यूटर)
2. माइक्रो कम्प्यूटर (क्लाइंट)
3. नेटवर्क स्विच/हब (10 बेस-टी या 100 बेस-टी)
4. नेटवर्क केबल (कोएक्सिएल, ट्विस्टेड पेयर या फाइबर ऑप्टिक)
5. डाटा बैकअप डिवाइस (डिजिटल ऑटो टेप)

केन्द्र में लोकल एरिया नेटवर्क को स्थापित करने हेतु एक दोहरी प्रोसेसिंग क्षमता का नेटवर्क सर्वर लगाया गया है। जिसकी प्रोसेसिंग की गति 2.4 गीगा हर्ट्ज है।

## Establishment of Local Area Network at NRCAF, Jhansi

Local Area Network (LAN) is a communication network used by single organization over a limited distance, which permits users to share information and resources. A LAN requires that the individual workstations (microcomputers) be physically tied together by cabling (usually coaxial or twisted pair) or by a wireless link, and that some network software resides on the servers' hard disk (this permits the sharing of peripherals, data and application programs). LAN can be established in different network topologies such as Bus, Star and Ring.

### Requirements for LAN

1. Network Server (Central Computer)
2. Client PCs with Network Interface Cards
3. Network Switch/ Hub (10 Base-T or 100 Base-T)
4. Network Cable (Co-axial, Twisted Pair or Fiber Optic)
5. Network Operating System (LINUX, Novell Netware or Windows Server 2003)
6. Data Backup Device (Digital Auto Tape)

For establishing LAN at the Centre, a dual processing capable network server has been installed and configured. This server has processing speed of 2.4 GHz and equipped with



यह सर्वर दो हार्ड डिस्कों से युक्त है। जिनकी डाटा स्टोरेज क्षमता 36 गीगा बाइट है। इस सर्वर में एक आंतरिक रेड (RAID) कन्ट्रोलर भी लगा है, जो कि एक हार्डडिस्क को दूसरी हार्डडिस्क में मिररिंग करता है। यह इसलिए आवश्यक है कि अगर एक हार्ड डिस्क काम न करे, तो दूसरी हार्डडिस्क उसकी जगह लेकर नेटवर्क को फेल होने से बचा सके। ऑटोमैटिक फेलओवर, ऐसेट ट्रैकिंग एवं सिक्योरिटी मैनेजमेंट, रिमोट सिस्टम इंस्टालेशन तथा रिमोट शट डाऊन एवं वेकअप इस सर्वर के उपयोगी कार्य हैं।

इस नेटवर्क के कुल 32 क्लाइंट बनाकर सभी वैज्ञानिक, लाइब्रेरी, कमेटी, प्रशिक्षण, कान्फ्रेस हॉल तथा प्रयोगशालाओं आदि को जोडा गया है। ये सभी क्लाइंट कैट-5 केबल के द्वारा सर्वर से जोड़े गये हैं जो कि 4 जोड़े वाला टुविस्टेड पेयर केबल है। इस नेटवर्क में हर कम्प्यूटर को भिन्न आईपी एड्रेस दिया गया है ताकि प्रत्येक की अलग पहचान रहे। क्लाइंट को सर्वर से जोड़ने हेतु 16 पोर्ट के 10/100 मेगाबाइट प्रति सैकेंड

(शेष पृष्ठ 4 पर)

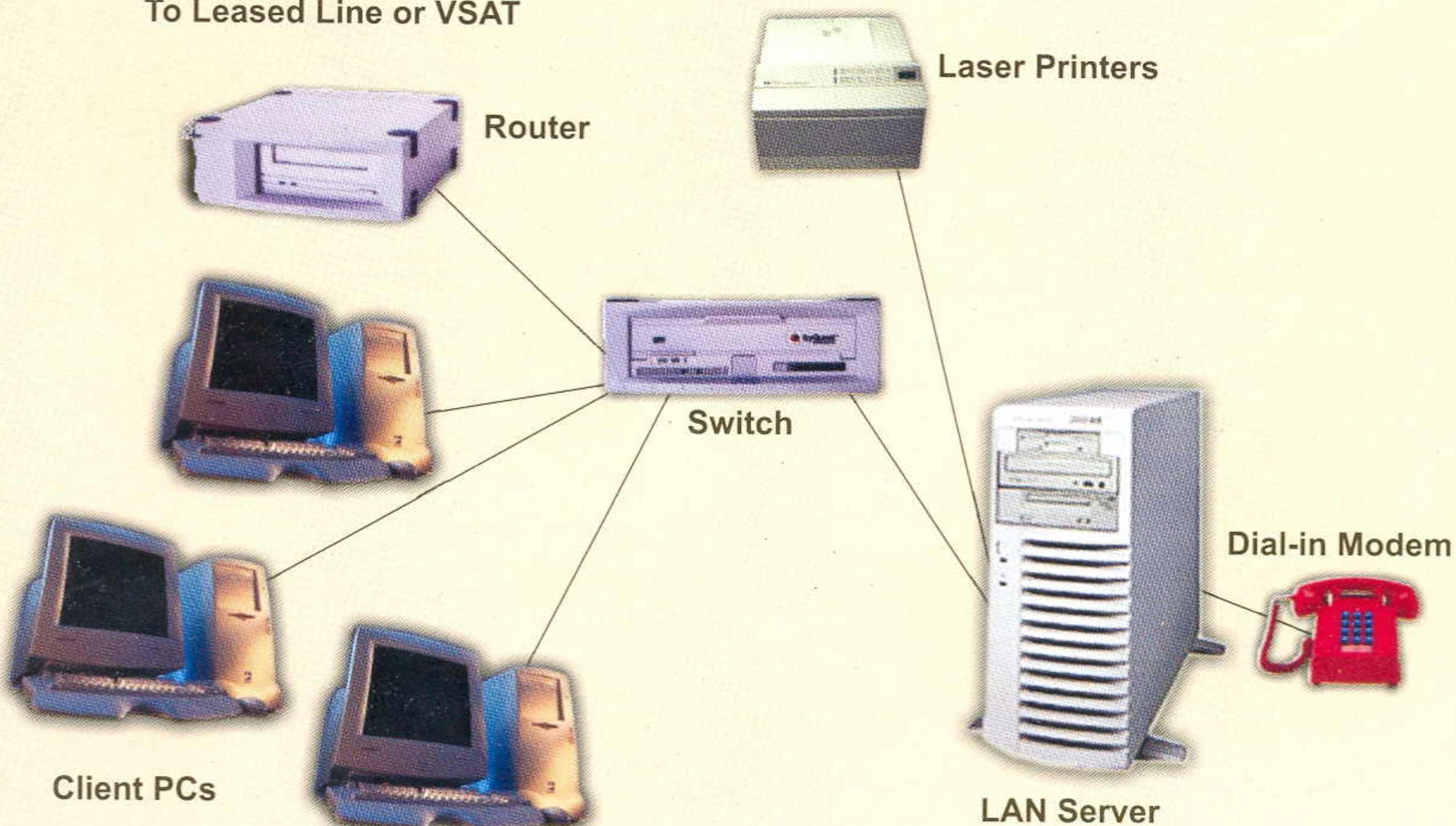
two hard disks each of 36 GB capacity. It has integrated RAID Controller, which is meant for mirroring one hard disk to another. This is necessary because if one hard disk fails, second hard disk will substitute it and prevent the network failure. Some useful features of this Server are: Automatic Failover, Asset Tracking and Security Management, Remote System Installation and Remote Shut Down and Wakeup.

A total number of 32 clients have been created for Scientists, Library, Laboratories, Conference, Training and Committee Room. These clients are connected to the network server using enhanced CAT-5 cable. CAT-5 cable is a twisted pair type cable having 4 pairs. Each client has been assigned a unique IP address for identification over network. For connecting clients to the server, three 16 ports 10/100 Mbps Switches of Fast Ethernet type (100Base-T) have been used. This switch has the ability to transmit and receive data at a speed of 100 Mbps. Advantage of using switch over hub is

(Contd. on page 4)

## Layout for Medium Size LAN

To Leased Line or VSAT





विगत वर्षों में देश के किसी न किसी भाग में सूखा पड़ना एक नियमित प्रक्रिया बन गयी है। भू जल स्तर के तेजी से नीचे गिरने के कारण किसानों की समस्याएँ अधिक तेज बढ़ी हैं। फलस्वरूप, खेती जो भारत की अर्थव्यवस्था की रीढ़ है, चरमरा रही है। सूखे के ज्ञात कारणों में प्रमुख है अत्यधिक भूजल दोहन, स्थाई वनस्पतियों में बहुत अधिक हास, भूसतही जल संग्रहण का



हास, लगातार कृषिकरण तथा मशीनीकरण के कारण भूसतह का बढ़ता जमाव (धनीकरण) गरीब व भूखे लोगों की क्षुधा शान्त करने के लिए अधिक पानी चाहने वाली फसलों की खेती को बेरोक-टोक करते जाना। ऐसी परिस्थितियों में एक ही उपाय शेष है, वह है कृषिवानिकी जो कि समुचित भूजल उपयोग सुनिश्चित करती है और कम पानी की उपलब्धता में भी अधिक आय, उत्पादन व रोजगार देने में सक्षम है। इसके अतिरिक्त कृषिवानिकी का महत्वपूर्ण अवयव "वृक्ष" भूमि में जल के प्रवेश को बढ़ावा देता है और पानी के बहने की गति को नियमित कर जल की बूंदों को जमीन में अवशोषित होने के लिए अधिक अवसर प्रदान करता है। इसे इस तरह भी समझ सकते हैं जैसे भोजन में रेशा, पाचक रस को भोजन के अन्दर प्रवेश करने में मदद करता है और भोजन में आवश्यक रूप से सम्मिलित किया जाता है। उसी प्रकार पेड़ों की मोटी जड़े जल को जमीन में प्रवेश कराने में मदद करती है। फसलों की अपेक्षा पेड़ों में शस्य-क्रिया कम करनी पड़ती है। इससे जुताई आदि के लिए भारी मशीनरी का उपयोग नहीं के बराबर होता है। परिणामस्वरूप मृदा ठोस होने से बच जाती है। फसली क्षेत्रों में फसल के साथ पेड़ लगाने से मृदा की उर्वरता बढ़ती है और मृदा के भौतिक तथा भौतिकीय, रसायनिक गुणों में भी सुधार होता है। पेड़ों से गिरी पत्तियों के सड़ने से उपर्युक्त के अलावा भू-जल धारण क्षमता बढ़ती है और मृदा में जल प्रवेशन शीघ्र होता है। सूखा सहने में पेड़ों के बहुआयामी योगदान को दृष्टिगत रखते हुए प्रत्येक खेत में फसल के साथ पेड़ अनिवार्य रूप से लगाना चाहिए। यह कार्य कानून द्वारा नहीं अपितु सभी की जन भागीदारी से किया जाना चाहिए। अतः मैं सभी कृषकों का आह्वान करता हूँ कि कृपया कृषिवानिकी अपनाकर भूमि और जल के संरक्षण व संवर्धन में अपना अपूर्व योगदान करें जिससे मानव, पशु व वनस्पतियों का कल्याण हो सके।

(पी. राय)

In recent past, occurrence of drought has become regular phenomena in one or the other parts of the country. Rapid depletion of ground water has refueled the vagaries of the farmers. Farming, the back bone of Indian economy, is on the stakes. Reasons for distress are not unknown.

Accelerated pumping of water, reduction in permanent vegetal cover, loss of permanent water bodies on earth surface, continued compaction of earth crest due to mechanization of farming are some to be blamed. Cultivation of high water requiring crops will go on unabated for filling belly of hungry and resource poors. Under such circumstances the only viable alternative is to adopt agroforestry land use which ensures better moisture use, less consumption of water, high tolerance to moisture stress and ability to yield under odds. In addition, tree component under agroforestry system ensures better intake of rain water in soil profile through deep penetrating thick roots and increase in opportunity time for rain water to percolate down. Interculture operation demand of trees is less as compared to crops, as such it restricts soil compaction. Introduction of trees in croplands increases organic carbon through literfall which in turn not only improves soil fertility but also improves soil physical and physico-chemical properties and soil infiltration. Keeping in mind, the immense role of trees in mitigation of drought, it should be mandatory to plant trees on croplands. This can not be done through legislation. This, in fact, requires mass awareness and action. People should come forward on their own for the betterment of land and water and above all for survival of vegetation, human and animal races.

(P. Rai)



के फास्ट इथरनेट प्रकार के तीन नेटवर्क स्विचों को लगाया गया है। यह स्विच, डाटा को 100 मेगाबाइट प्रति सैकेंड की गति से लाने व ले जाने में सक्षम हैं।

नेटवर्क प्रबंधन, नियंत्रण एवं संतुलन के लिए विन्डोज सर्वर 2003 नेटवर्क ऑपरेटिंग सिस्टम को सर्वर की हार्ड डिस्क पर लोड किया गया है। इस सॉफ्टवेयर के द्वारा सर्वर को कई तरह से उपयोग में लाया जा सकता है जैसे फाइल सर्वर, मेल सर्वर, बेव सर्वर के रूप में, इत्यादि। अभी इस ऑपरेटिंग सिस्टम के 25 क्लाइंट प्रति सर्वर लिए गये हैं। जिसको बाद में आवश्यकतानुसार बढ़ाया भी जा सकता है। समय-समय पर सर्वर में स्थित डाटा के बैकअप के लिए एक 12/24 गीगा बाइट की डिजिटल ऑटो टेप ड्राइव भी लगाई गई है। ताकि सर्वर का डाटा सुरक्षित रखा जा सके।

इस लोकल एरिया नेटवर्क की स्थापना से निम्नलिखित स्रोतों का आदान-प्रदान किया जा सकता है :

1. हार्डडिस्क (फाइल एवं फोल्डर)
2. एप्लीकेशन साफ्टवेयर
3. प्रिंटर एवं स्कैनर
4. इंटरनेट
5. सीडी रोम सर्वर

भविष्य में इस नेटवर्क के माध्यम से बेव सर्वर के द्वारा इंटरनेट स्थापित करने की योजना है। यह इंटरनेट केन्द्र में डिजिटल रूप में सूचनाओं के आदान-प्रदान में सहायक होगा। ये सूचनाएं केन्द्र की विकसित वेब साइट पर प्रकाशित की जा सकेंगी।

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that it increases capacity and decreases network loading by dividing a network into different segments, which do not compete with each other for network transmission capacity.

For management, control and smooth functioning of network, Windows Server 2003 software has been installed and configured on the server. Using this software, different roles may be defined for the server as per the requirement. Server roles include *File Server, Application Server, DNS Server, WINS Server and Mail Server*. Presently this network operating system has 25 clients per server and more clients may be added if required. An internal 12/24 GB Digital Auto Tape (DAT) drive has been installed for schedule backup of data and disaster recovery.

With the establishment of the Local Area Network at the Centre, following resources may be shared:

1. Hard Disks (Files & Folders)
2. Applications Software
3. Printers & Scanners
4. Internet (WWW, E-mail, etc.)
5. CD-ROM Server (For accessing AGRIS, TREE CDs etc.)

Future plan is to install *Web Server* and establish **Intranet** through the developed web site using this local area network. This Intranet would facilitate the access of digitized information such as Research Publications, Annual Reports, Newsletters, etc. within the Centre. Also domain name for this web server would be registered so that Centre's web site may be hosted on this Server and can be accessed online.

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## WOMEN EMPLOYMENT THROUGH AGROFORESTRY

Women are traditionally important participants in both the agricultural and forestry components of agroforestry and agri-horticultural production. They are often the prime users of forestry and horticultural products such as fuel, food, fruits and fodder. Women are primarily responsible for wood collection and often the initial establishment and

tending of the wood stock around the village. The report of the expert group of women and forest Industries in UNESCAP noted that as much as the two third of the time spent collecting fuel wood was the women.

Men are more likely to be interested in forest



products for commercial sale and in the use of products farther from home where as, women collect fuel wood and food from forests and individual trees. They have knowledge about the buring characteristics of various species and about species which have food value. Both men and women make medicines from tree and forest products, but for different purposes. Women also use forest products for basket making and dyeing. It might be expected that women would have a more detailed knowledge of trees and their uses. Women's close involvement with tree products and agricultural production often results in their greater awareness of environmental problems.

Women, both individually and in groups have private influence in public action and undertake public action themselves. Their potential for public action in areas such as reforestation, soil and water conservation is high because they are the sufferers from environmental degradation. It is they who must walk farther for water, fuel wood and fodder. It is they who must produce subsistence on increasingly degraded soils. It is they, who are able and likely to organise the community for action.

Agricultural women have the biggest stake in wasteland development programme, because the increase in fuel wood, fruit and fodder production from these lands will make their life easier on the one hand and provide additional economic avenues on the other. The wastelands and panchayat lands scattered all over the country can become numerous centres of employment for farm men, women and children near their own villages and relieve the pressure of migration from villages to urban areas. Tree plantation and grassland development programmes are labour oriented and will not only help in reducing the drudgery of farm women by generating employment and economic support. These activities will also help in conservation of soil and water, there by reducing the severity of floods and drought. Farm women can participate in planning process like choice of species, collection of seeds, raising of nursery, plantation of trees, after care and maintenance, harvesting and sharing of benefits.

The poor rural women are active participants in contributing towards the economic well-being of the family and the nation. When certain projects and programmes are implemented all developmental plannings should anticipate its adverse impact on women. Technology does not affect women *per se*, but when programmes to counter displacement of labourer in rural areas are planned, special efforts should be given to the need of women too. Programmes providing alternative employment on farm, off farm and non farm activities should consider and incorporate women's capabilities and potentials. Therefore, every effort should be made to train them with new marketable skills and technology. By investing in women with the relevant resources, one can ensure increased productivity in the country. Women empowerment through agroforestry and agri-horticulture can be emphasised through following suggestions :

- Agri-horticulture, silvi-pastoral and compact block plantation development in presently unutilized wastelands will help to improve the land resources, reduce the severity of floods and drought, relieve the dudgery of farm women by increased availability of fodder, fruits, food and fuel and create large scale, employment at village level.
- Wasteland development programme through agroforestry and agri-horticulture to create large scale employment on one hand and economic resource development on the other.
- Plantation crops which provide maximum earning from agricultural products have substantial employment to farm women in production as well as processing sector. Technologies which improve efficiency but do not displace the labour, need to be developed.
- Farm women, after suitable training should be employed for producing elite planting material of plantation crops and tree species.
- Crop diversification in plantation crops based agroforestry and agri-horticultural systems,



which include trees and other plantation crops, horticulture, fodder, animals etc. will help to increase the year round employment as compared to monocrop. This will also mitigate the problem of production and price uncertainties.

- The extent of involvement of farm women can be profitably increased in production, processing and marketing of fruits, vegetables, flowers, wood and non wood products.

Women empowerment through agri-horticulture has a great potential. Most of the land under these orchards remain unutilized. It has been possible to grow turmeric, ginger, dioscorea, colocasia, elephant foot yam and sweet potato even under heavy shade to the extent of 80%. The loss in yield is proportionate to the increased intensity of shade. With shade intensity 20-30% less, the loss in yield is less than 20% and in these orchard spices and vegetable crops like garlic, onion, chillies, tomato, radish; fodder crops like guinea grass, oats, berseem, lucerne, hybrid nappier and some medicinal plants like lemon grass, citronella, menthol, etc. have potential. Under shade the

quality of fodder crops also improved due to increase in protein content of the species by 1 to 2% under shade. As additional advantage of these intercrops is that they will provide additional flora for sustainability of honey which is vital for more production of honey throughout the year.

Thus, the inclusion of women is essential for success of agroforestry programme, but it may require change in approach and personnel of forestry, horticulture, agriculture and extension departments. This would include diagnosing the existing agricultural and resource management system to determine what women presently use and what they need; analysing the constraints imposed on the women's agroforestry by social institutions such as land tenure or property laws or the division of labour by gender; arranging a format for discussions which women which enables them to express their concerns and questions freely, and by hiring women extension workers and technical personnel who can work easily with both men and women.

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## स्टाफ अनुसंधान परिषद

डा. पी. राय, निदेशक (कार्यवाहक) की अध्यक्षता में स्टाफ अनुसंधान परिषद की वार्षिक बैठक दिनांक 28 से 30 जून, 2004 को सम्पन्न हुई। केन्द्र के सभी वैज्ञानिकों ने उक्त बैठक में भाग लिया।

मुख्य कार्यक्रमों के पाँचों कार्यक्रम समन्वयकों द्वारा कार्यक्रमों के बारे में संक्षेप में जानकारी दी गयी तथा सभी प्रोजेक्ट लीडरों द्वारा अपने-अपने प्रोजेक्ट की प्रमुख उपलब्धियों को सदन के सामने प्रस्तुत किया। केन्द्र द्वारा चलाये जा रहे सभी प्रयोगों के प्रस्तुतीकरण के बाद डा. आर.वी. कुमार, वरिष्ठ वैज्ञानिक एवं श्री आर. एच. रिजवी, वैज्ञानिक ने अपने-अपने नये प्रयोगों के प्रारूप को प्रस्तुत किया जिन पर सदन में गम्भीरता से वार्तालाप किया गया।

## STAFF RESEARCH COUNCIL

Annual Staff Research Council (SRC) meeting was held from 28<sup>th</sup> to 30<sup>th</sup> June, 2004 under the Chairmanship of Dr. P Rai, Director (Acting) of the Centre. All the Scientists of the Centre attended the meeting.

Programme Leaders of five mega projects presented over view of their respective programmes in brief and all the project leaders presented research highlights of their projects for the period 2003-04. After presentation of research highlights of the on going projects, Dr. R V Kumar, Sr. Scientist and Sh. R H Rizvi, Scientist presented the new project proposals which were thoroughly discussed in the house.



# ANNUAL GROUP MEETING OF ALL INDIA COORDINATED RESEARCH PROJECT ON AGROFORESTRY (AICRPAF)

The Annual Group Meeting of AICRP on Agroforestry was organised by Dr. P Rai, Project Coordinator, AICRPAF and Director, NRCAF Jhansi. The meeting was held at UAS, Bangalore from 15<sup>th</sup> to 17<sup>th</sup> May, 2004. Dr. J S Samra, DDG (NRM), ICAR, New Delhi was the Chief Guest and Dr. M N Sheelavanthar, Vice Chancellor, UAS, Bangalore, presided over the group meeting. Dr. S.N. Rai, PCCF, Karnataka was the Guest of honour. Dr. K R Solanki, ADG (AF), ICAR and about 100 delegates including Officer in-Charge's of the coordinating centres and Principal Investigators of adhoc research schemes under AP Cess Fund (Agroforestry) attended the group meeting. Dr. O P Chaturvedi, Pr. Scientist, DR. K Kareemulla, Sr. Scientist and Dr. A K Handa, Sr. Scientist from project coordinating unit, NRCAF, Jhansi attended the meeting.

Dr. P Rai, Project Coordinator, AICRPAF and Director, NRCAF Jhansi presented the coordinator's report for the last year and highlighted the research achievements of the project. In his report he focused on the recommendations of second QRT for individual centres and informed the house that on the recommendations of second QRT a book on Methodologies in Agroforestry Research has been compiled and published containing chapters on methodologies for different aspects of Agroforestry. The report also focused on the work initiated by the coordinating centers on germplasm collection and evaluation of Jatropha and Pongamia. Dr. K R Solanki, ADG (AF) in his special remarks emphasized that maximum potential of agroforestry can be tapped under stress conditions like drought. Agroforestry can play an important role in meeting the requirements of fodder, fuelwood and food during drought. Afterwards, the Dr. J S Samara, DDG (NRM) presented the chief

guest address. He emphasized upon the fact that agroforestry is providing livelihood to rural masses and tribes, we have to extend the opportunities and commercialization has to come through agroforestry. In north west India, there are about 500 small scale industries based on poplar plantations. However, there is no regularized marketing of the produce. The strength of agroforestry lies in proper selection of species like aonla which is very drought resistant and synchronizes its growth with rainfall. The planning of agroforestry research should be to enhance the socio-economic level of poor landless and marginal farmers and women. There is need for more studies on carbon sequestration. The promotion of agroforestry will accelerate with the advent of carbon trading as trees are big sequesters of carbon.

Dr. S N Rai, the Guest of honour addressed the delegates. He emphasized on the need of inclusion of water harvesting technologies and fruit trees in the research of agroforestry. Dr. M N Sheelavanthar, Vice Chancellor, UAS Bangalore, in his presidential address emphasized the need of on-farm, participatory, collaborative and farmer's beneficial research in agroforestry. He reiterated that farmers economic security should be the prime concern of researchers. For the purpose, the research should be carried out in tandem with industrial demand, without collaboration and tie-up with industry there will not be stable success. There is need for value addition for the benefit of farmers economic security. At last Dr. K Pandurangaiah, OIC (Agroforestry), UAS, Bangalore proposed the vote of thanks.

**A K Handa, P Rai and Uma**  
National Research Centre For Agroforestry,  
Jhansi-284003



## मानव संसाधन विकास

डा. अजीत, वरिष्ठ वैज्ञानिक ने राष्ट्रीय पर्यावरण विज्ञान अकादमी, नई दिल्ली द्वारा आयोजित रीसेन्ट ट्रेंड इन एनवायरनमेंटल साइंस विषय पर अन्तरराष्ट्रीय संगोष्ठी (दिनांक 24-26 अप्रैल, 2004) में भागीदारी की।

## HUMAN RESOURCE DEVELOPMENT

Dr. Ajit, Sr. Scientist of the Centre participated in the International Conference on "Recent Trends in Environmental Sciences" organized by National Environmental Science Academy, New Delhi from 24-26 April 2004.

## अनुसंधान सलाहकार समिति

राष्ट्रीय कृषिवानिकी अनुसंधान केन्द्र तथा भारतीय चरागाह एवं चारा अनुसंधान संस्थान, झाँसी की अनुसंधान सलाहकार समिति की बैठक संयुक्त रूप से दिनांक 7-8 जून, 2004 को भारतीय चरागाह एवं चारा अनुसंधान संस्थान, झाँसी में आयोजित हुई। केन्द्र के निदेशक (कार्यवाहक) डा. पी. राय ने केन्द्र की गतिविधियों का विस्तार से वर्णन किया।

## RESEARCH ADVISORY COMMITTEE

The combined Research Advisory Committee (RAC) meeting of IGFRI as well as NRCAF, Jhansi was held on 7-8<sup>th</sup> June, 2004 at IGFRI, Jhansi. Dr. P. Rai, Director (Acting), NRCAF presented the overview of the Centre.

## आगन्तुक

डा. वी.पी. गुप्ता, भूतपूर्व कुलपति, आर.ए.यू., पूसा एवं अध्यक्ष (अ.स.स.) ने अन्य सदस्यों के साथ केन्द्र पर भ्रमण किया।

डा. के.आर. सोलंकी, सहायक महानिदेशक (कृषिवानिकी), भारतीय कृषि अनुसंधान परिषद, नई दिल्ली।

## VISITORS

Dr. V P Gupta, Ex. Vice Chancellor, RAU, Pusa & Chairman (RAC) along with members of RAC Visited the Centre.

Dr. K R Solanki, ADG (AF), Indian Council of Agricultural Research, Krishi Bhavan, New Delhi.

### प्रकाशक निदेशक

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डा. पी. राय, निदेशक (कार्यवाहक)

संकलन एवं सम्पादन

आर.के. तिवारी, राजीव तिवारी एवं ओ.पी. चतुर्वेदी

मुद्रक : मिनी प्रिन्टर्स, झाँसी. फोन : 2447831, 2446820

### Published by Director

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Printed at : Mini Printers, Jhansi. Ph : 2447831, 2446820