

Agricultural Research and Extension Project
Ministry of Agriculture and Nepal Agricultural Research Council, Nepal

Communication technologies and media for agricultural extension and research in Nepal

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Introduction

Major communication recommendations made by communication consultants in August (joint report by international and national consultants) and September (national consultant) reports are summarised here. These recommendations include ACD, RCUs, NARC and NARC outlying stations and IAAS. These recommendations are made based on the need identified through review and observation of current communication programmes, field visit and series of formal and informal meeting and discussion with all concerned staff. If these recommendations are implemented by the concerned institutions, a significant improvement can be achieved in agricultural communication services of agricultural research and extension system in Nepal.

Agricultural Communication Division (ACD)

ACD Radio

Improve the research basis of radio programmes by ACD management requiring that each radio script is approved by a researcher in the relevant field. This would be made easier if scripts were prepared in consultation with a researcher, keyboarded onto the computer and emailed (or faxed) back to the relevant researcher before the broadcast.

Keeping the scripts on the computer would enable ACD to build up a written record of broadcasts in addition to the audiocassette recordings currently maintained. These scripts could then be adapted and recycled easily in the future, for example for use in regional radio broadcasts, or turned into other media such as posters or information sheets.

Improve the field orientation of radio programmes by increasing the mobility of radio interviewers. This would enable them to make more information-gathering trips to collect interviews with farmers, extensionists, and researchers. This would in turn require improved access to existing ACD vehicles, and support for field expenses and staff per diems. The model used by the BBC World Service's Farming World programme could be adapted: to gather material for this magazine programme, reporters regularly travel with a portable cassette recorder and microphone in search of stories to gather interviews and background information. Two weeks of travel to a region could generate several months' worth of material for broadcast. This mode of information-gathering could be used by ACD's radio team, as well as by regional communication unit staff.

Plan campaigns to promote newly released crop varieties, announce new technologies that produce dramatically higher yields, respond to pest outbreaks, or alert listeners to changes in government policies. An entire week of radio broadcasts, for example, could be devoted to a particular pest problem. Such efforts should be coordinated where possible with other media, including television broadcasts, printed publications, and press releases.

Experiment with new programme formats, such as 15- or 30-second spots, jingles, magazines (programmes consisting of a succession of short items, separated by musical interludes), and drama. Minor improvements can be made even within existing programmes, such as introduce new characters into the long-running JT/old lady programme, or inserting musical interludes into the Activities broadcast. These new, livelier formats would be a welcome change from the monologues, dialogues and discussion forums currently broadcast. They could be fitted into the existing 6:40–6:55 pm time slot, or new time slots could be used (though this would require additional resources to pay for air time). It should be noted that ACD prepared an innovative series of public-service announcements for broadcast several times a day, but funding for this was unfortunately not approved. Efforts to obtain support for such initiatives from government, NGO or private sources should be intensified.

Explore private-sector sponsorship for programmes. One option would be to seek private-sector sponsorship for farm programming, with ACD (or the regional communication units) preparing content in collaboration with Radio Nepal, and the sponsor supporting the costs in return for advertising time (using the model followed by public television in the United States). This may be a particularly promising approach in the regional radio stations. Care must be taken to ensure editorial freedom, and to avoid the promotion of harmful products (such as pesticides). It may be that the most appropriate sponsor of a farm

programme is a firm unrelated to agriculture. Such a firm may be interested in sponsoring a farm programme because of the large audience that the show draws, rather than its content *per se*.

Provide in-service training to ACD's radio staff, specifically on radio drama and radio magazine programme production. Radio Nepal should be able to offer such training on an individual basis.

Produce programmes targeted to specific audience groups : women farmers, rural youth, commercial farmers, farming communities in different agro-ecological regions etc. For example, one programme a week could be devoted to women farmers, another to youth, etc.

- ACD's radio programme would need to focus major areas that farmers need information for their farming practices. Crop production, livestock production and marketing are the key components of Nepalese farming system that need to be addressed in a more balanced way.
- It would also need to produce and broadcast programmes on group process, social mobilization, marketing, agro-based enterprises, extension approaches, etc., targeted to specific audience groups.
- Farm radio programmes would be more effective if there were more interviews of scientists, subject matter specialists, extension officers, veterinary doctors in their respective fields, giving more practical and useful information to farmers, and farmer interviews based on their experience of successful farming.
- Need to seek new and latest sources of information through regular contact with NARC scientists, researchers, SMSs, extension officers and farmers out in the field.
- As in ACD's publication and video units, the radio unit would also need to introduce some reward or financial incentive system in order to encourage script writers and contributors to the radio programme. It is realised that the provision of financial incentives has shown effect by enhancing willingness of the concern individuals in contributing information and offering cooperation to ACD's print and TV production programmes.. Therefore, some financial incentive or reward system would also help improve the quality and usefulness of the broadcast programme by receiving better cooperation of potential contributors.

ACD Publications

Artist. ACD *must* have at least one experienced artist to illustrate its publications. The vacant position for an artist should be filled as ACD's top staffing priority. Meanwhile, ACD should hire an artist on a contract basis to illustrate its publications.

Publication design. Redesign publications so they are based on pictures with minimal text: single sheets, mini-posters, flipcharts. There is considerable scope to make ACD publications more effective and more easily understandable by changing the design and presentation, and improving the balance between text and illustrations.

- Write for the intended readers' level of understanding. Use simple words and short sentences, and translate technical terms into simpler, more understandable words.
- Dramatically increase the number and quality of illustrations. Most publications should be visually based rather than text-based, relying on pictures rather than words to attract attention and carry the main message.
- Revise the layout to make it more attractive.

Content. Develop publications that focus on social topics such as marketing, credit, group organisation, extension methods, cooperatives, prices, produce processing, agro-based income-generating activities, and farm management.

Audiences. ACD should identify other audiences (such as pesticide dealers, seed suppliers, women farmers, children), develop materials especially for them and seek ways of distributing materials to them (see *New types of publications* and *Distribution* below).

New types of publications. ACD should expand the range of types of publications it produces and the range of audiences it targets. A portion of the annual publications budget could be reserved for innovative publication types such as those below.

- **Information sheets.** Single, illustrated information sheets have been used successfully in many countries, including Australia, the United States, Indonesia and Burma. If designed appropriately, they can double as mini-posters, for example, being posted on walls of tea shops and meeting places. ACD's current folder and pamphlet series could be replaced entirely by such information sheets.
- **Cartoons.** Cartoons can be very valuable teaching and learning tools. A comic strip tells a story, and carries a message, in an entertaining and informative way.
- **Fotonovelas.** A *fotonovela* is a comic book that uses a series of photographs instead of drawings. They typically tell a story, with several characters and a strong plot—like a drama film. They are produced by developing a script and planning the shots to go with it, then shooting still pictures of actors, and adding speech bubbles to convey their words. *Fotonovelas* could be useful in promoting practices such as safe use of pesticides, use of credit, treatment of livestock diseases, produce marketing, and planting of new crops and crop varieties.
- **Children's books.** Children are often the most literate members of farm households. Producing illustrated books on farming aimed at them can be the most effective way of reaching their parents also. ACD could explore the possibility of developing and distributing such materials with the Ministry of Education and with NGOs involved in education.

Distribution. ACD should be given more funding for distribution. This would enable its publications to reach a wider audience more effectively. Without additional funds or innovative distribution methods such as those suggested below, most publications will remain with the extension agencies rather than being spread to the end users, farmers.

If additional funding is not forthcoming, extra money could be put into distribution by shifting resources from production to distribution, perhaps by cutting the weight of publications by decreasing the number of pages (for booklets and the magazine), or reducing the numbers of booklets produced (but increasing the number of single sheets).

ACD should ship publications directly (rather than via regional offices) to districts served by courier (mainly in the Terai and road-linked hill districts). For inaccessible hill and mountain districts, it should courier the publications to the regional office and provide them with funds to ship them on to the relevant districts. It may be possible, for example, to strike a deal with local helicopter airfreight companies to ship publications at a cheaper-than-usual rate whenever spare freight capacity is available.

ACD should explore innovative distribution channels outside the extension system, such as farm chemicals dealerships, seed supply chains, NGOs, schools, and health clinics. It should encourage regional and district offices to do the same.

Collaboration with the private sector. ACD should explore the potential for collaboration with private firms to produce and distribute materials of common interest. One obvious example is the promotion of the safe and appropriate use of pesticides: this is in the best interests of both the government and pesticide dealers (who stand to lose if their products are wrongly applied or if farmers fall ill when using them). ACD could collaborate with one pesticide firms (or an association of firms) to develop information materials (print, radio and video) to produce and distribute information on pesticide safety. The firms might just be interested in sponsoring the production of such materials and in distributing copies along with their products through their normal supply chain.

Commercialisation. ACD should consider the sale of publications through commercial booksellers. This would probably require an improvement in the print quality of publications, especially of the cover.

Copublication. ACD should explore copublication arrangements with private publishers, or marketing arrangements with booksellers, for example to produce and sell booklets on key crops. Private publishers have links with booksellers in many district towns; by linking with them, ACD can develop new channels to disseminate information to new audiences. Eventually, ACD may choose to become a fully fledged publisher itself of agricultural books: its semi-autonomous status could be an ideal vehicle for this.

Training. Writing, editing and designing extension publications is a highly skilled job. ACD's publications editors must be computer-literate and should be trained in writing, word processing, desktop publishing and graphic design. Courses on writing and editing may be available in Nepal (through such organisations as the Nepal Press Institute and Tribhuvan University). Other training on specific publications skills, such as word processing, desktop publishing, publication design and (possibly) press operation, is available at low cost in Kathmandu.

ACD Video

ACD'S videos have three main potential uses: broadcast, and training of extensionists and farmers and group communication.

Video for broadcast. The current system of producing videos for airing on Nepal TV seems to be working well and should be continued.

Video for training. This should be the major mechanism for using video to reach extensionist and farmer audiences. The documentary format of ACD videos is ideal for training purposes. ACD should ensure that all Nepali training institutions (central and regional agricultural training centres, IAAS, and the vocational schools system) have a complete set of relevant videos. Mechanisms for ensuring this may include:

- Negotiating with the training institutions for bulk purchase or subscriptions for multiple copies of ACD videos.
- Improving the ordering system for video copies. The current range of videos available is listed in the Agricultural Diary, but the ordering system is not working well, possibly because of the high dubbing costs advertised.
- Reducing the price of video copies for all purchasers, or just for certain categories of customer such as training institutions and other government agencies.

ACD should procure a multiple video copier to enable it to make copies videos for distribution to clients.

Video for group/community communication. Successful cases can be video recorded and use as group media to disseminate the successful technologies to the farmers

Sharing production costs. There is a clear demand among various institutions (including NARC and NGOs) for quality video programmes of the type ACD is capable of producing. However, the potential clients do not feel able to pay the rates that ACD charges under the terms of its semi-autonomous status. At the same time, ACD needs to produce programmes for its fortnightly broadcasts. ACD should explore ways of sharing costs with these clients, whereby ACD produces a programme that can be used by the client as well as being broadcast as part of the fortnightly schedule.

Programme types. There is considerable scope for diversifying the types of programming produced. Aside from documentaries, ACD could also produce magazine programmes, drama, 1st-person documentaries (where the narrator appears on-camera), spots for airing as public-service announcements, etc. ACD could also explore the possibility of developing trailers to be dubbed onto videocassettes of entertainment films that are rented out by private distributors, following an approach successfully used by Unicef and others in family planning and health campaigns.

Improving production processes. ACD staff should seek efficiencies in producing materials. Examples of possible improvements include planning programmes using a storyboarding technique (where audio and video are presented side-by-side), developing a shot-list for each cassette (so the producer can tell the editor which shots to use), preparing scripts on the computer rather than by hand, and developing libraries of useful footage and of music.

Sharing with radio. There could be greater synergy between ACD's video and radio units. They could share programme ideas and scripts, use each others' recording facilities (the video unit could use the radio studio for recording narration; the radio staff could use the video studio for recording music or large groups that would not fit into the small radio studio), and prepare campaign materials together (for example, to promote a newly released crop variety or to alert farmers to a pest outbreak).

Staffing. The current vacant position of video camera operator should be filled with a person with both camera-operation and editing skills. This would ease the most serious bottleneck in video production.

Equipment. ACD should procure a multiple video copier (see above).

Computers

Computers need to be given a much higher priority by ACD. All ACD staff of technical level or above should become computer-literate. Most ACD tasks should be shifted to computers, and the number of computers should be increased markedly.

These are, of course, long-term goals. But a start must be made now if ACD is to become an efficient media-production organisation.

Replace Macs. As the elderly Macs begin to fail, they should be replaced with Windows machines. This is necessary because of the expense of repairs and the overriding need to be compatible with other units in the Ministry and with NARC.

Computerise operations. Each unit (publications, administration, radio, video) should have at least one computer for writing, editing, management and record-keeping. All publications manuscripts, radio and video scripts should be prepared on the computers, and a master copy maintained for future use.

Computer training. All ACD staff of the technical level and above, including management, must be provided with computer training. They must become familiar with word processing, email, file management and virus protection. Relevant staff should also receive training in desktop publishing and graphic design (for publication layout), spreadsheets (for accounts), database management (for address lists), and internet search (for information seeking).

Email. ACD should develop a strong email capability, and identify linkages with NARC, NGOs, regional and district offices, and other information sources and audiences.

ACD in general

Promoting information. ACD must recognise that it is in a marketplace for information. It produces a series of products (publications, video and radio programmes), and its goal is to ensure that these products are read, watched and listened to. If its clients cannot get these products, do not "buy" them, or do not use them, then it is not enough to blame the clients. Rather, ACD must adjust what it does: change the type of products it produces, their price, or how they are distributed. ACD must therefore be innovative, even within current tight budget constraints, in order to adapt its messages and distribute them more efficiently.

Generating additional income. ACD should seek to maximise the use of its excess production capacity in order to generate income. This income can then be used to reward staff appropriately, thereby partly solving the current low staff-morale problem. ACD should contract a business development and marketing specialist to generate business for the division; this person's salary could be tied to the amount of additional income he or she generates. ACD should contract in other staff as required (for example, to operate the presses and to collate and bind publications).

In the longer term, the Ministry of Agriculture should consider renegotiating the terms of the ACD autonomy agreement. Possibilities that should be considered include:

- Allowing ACD to retain all of the funds generated from the sale of its services, but paying a smaller proportion of the regular costs. This would force ACD to be more entrepreneurial in their search for business. It could use these to reprint best-selling titles, develop new media materials, hire new staff or reward existing staff, or invest in equipment.
- Freeing ACD from civil-service staff hiring and salary regulations. This would enable it to reach more appropriate staffing levels (probably by increasing staffing in the production areas and reducing the

number of administrative staff), free it from the apparently random transfer of skilled staff to other parts of the ministry, and allow it to pay staff at rates closer to those prevailing in the private sector.

- Privatising ACD completely. In this case, the Ministry of Agriculture might be allocated a certain amount of funds for extension materials, which it would be required to contract out. ACD would have to compete with other private companies for such contracts. The Ministry might retain some influence on the ACD board, but would not control it.

Any change in the status of ACD should be preceded by a careful economic and organisational analysis to ensure that it would be a viable media-production concern. We have made no attempt to perform such a study.

Participatory management. Senior ACD managers should adopt a more proactive, approachable and participatory management style, making a conscious effort to listen and respond to staff concerns, and should welcome their inputs and suggestions. ACD has a number of highly professional staff, and managers should treat them as such. While it is sometimes necessary as a manager to wield a stick, this approach should be used only very occasionally; it is better to use carrots, which can range from congratulations for a job well done, to formal recognition and rewards for excellence and innovation.

Staff skills. ACD should place priority on providing its management and officer-level staff with training in development communication and media production techniques. Because it is such an important underlying constraint, we deal with the issue of communication training separately below.

It is particularly important that the ACD managers and officers gain a deeper appreciation of the work performed in the unit. Perhaps individual officers and managers could spend a day a week in each of the three units in turn, working as an "apprentice" to the technical staff. They would soon learn the problems and possibilities of operating the equipment.

ACD managers would gain deeper insights into the potentials of development communication if they were to go on a study tour of similar institutions in other countries. A visit to the Institute of Development Communication at the University of the Philippines at Los Baños (UPLB) would be ideal. This could be combined with a suitable short course at UPLB, and visits to institutions such as the Asian Institute of Management (Bangkok) and the Asian Mass Communication Research and Information Centre (Singapore).

In the longer term, a degree in development communication should be a prerequisite to appointment at the officer or manager level in ACD.

Monitoring and evaluation. ACD should designate an existing staff member as responsible for monitoring and evaluation of media outputs. This person should be trained to design, implement and analyse simple audience surveys, monitor media outputs (for example, to ensure a proper balance between crops and livestock programming), and to ensure that messages have a firm base in both research and in the field. Findings should be used to guide future directions for programming and publications activities.

Regional Communication Units

Staffing. For the RCU to be functional effectively, there should be at least a core team of three persons deputed as full time staff. The team of staff should be composed of an officer, a JT and a JTA level. Their job need to be defined and specified (Annex 1 of main report). Though administratively, RCUs are located with RAD, but technically they should be under the line of command (programme, budget and technical support) of ACD.

Relations with other departments and divisions. In order to achieve better coordination and support in providing communication services to all departments and division of MOA, ACD should be shifted up from the present organizational level and placed directly under the MOA.

Office facilities. Basic logistics facilities for operating RCU such as furnitures and shelves for the safe keeping of the tools of the trade, vehicle for field recording of audio and video programmes need to be provided. A small studio for programme production and computer for

keying and storage of script would need to be available for RCU to function effectively and efficiently.

Radio programme production studio. One specific problem related with the farm radio programme production in Eastern Region is the physical distance (about 200 km) between the Regional Radio Station (RRS) (Dhankuta) and the RCU (Biratnagar). RCU staff have to travel to RRS Dgankuta every week to produce weekly programme which is not economic and efficient in term of cost and staff time. The optional solution to this problem is to build a small recording studio in RAD, Biratnagar where RCU staff could produce radio programmes and send recorded cassettes to RRS Dhankuta for broadcasting. This will allow sending several programmes to RRS at a time and reduces the staff's travelling time and cost, and also enhance staff's skills and confidence to produce better radio programme by themselves. Such a small studio would be needed for making the regional farm broadcasting interesting and effective even in other region too except Central Region. In Central Region ACD's production studio can be shared for regional programme production as well which is being effectively done at present without any difficulties.

Video. The provision of sophisticated, bulky and heavy equipment to the RCUs presents a quandary. Two avenues are open:

- **Option 1.** Withdraw the S-VHS equipment (or put it in mothballs), and replace it with lightweight field equipment: a VHS home video camera and playback equipment (monitor and VCR). Provide RCU staff with 2 weeks of hands-on training in video shooting and programme planning. This would enable the RCUs to shoot footage for showing to farmers in other locations. If the goal of providing footage for broadcast is still to be pursued, the camera should be of sufficient quality to ensure acceptable video quality. Once the RCU team is skilled in producing acceptable footage using the portable equipment, they can be given a refresher and upgrading course and graduate to the more sophisticated S-VHS equipment to produce higher-quality footage.
- **Option 2.** Provide additional training to the RCU staff in the use of the existing S-VHS equipment. We estimate that it will take perhaps 4 weeks of training for them to be able to produce acceptable footage using this equipment. Provide them each with a vehicle (as already budgeted under AREP). Also provide a portable monitor and VCR so they can show footage to farmers in other locations.

Of these two options, we believe that the first is more likely to produce long-term, sustainable results..

The training required could be provided by a combination of one of us (Upendra Phuyal), Nepal TV, and by ACD video staff through internships at ACD or secondment for 2 weeks to each of the RCUs in turn. In the long term, IAAS should be able to provide such training through its degree and short courses.

Radio. Improving the quality of the RCUs' radio outputs is likelier to be easier.

- Provide a lightweight portable audiocassette recorder and dynamic microphone for field interviews.
- Provide RCU staff with a minimum of 2 weeks of hands-on training in scriptwriting, audio recording and interview techniques. This training could be provided by Radio Nepal, Radio Sagarmatha, or by ACD radio staff or by any other appropriate institutions through internships at ACD or secondment to each of the RCUs in turn. In the long term, IAAS should be able to provide such training through its degree and short courses.

RCU tasks. In our view, the RCUs should have four main tasks (in order of priority):

- **Preparing radio scripts** for broadcast on the local Radio Nepal station. This should be their main task. The scripts should include field interview material as well as narration, perhaps in a magazine format. They should also include the market prices of key farm commodities in important regional markets (see below).

- **Gathering stories** in audio or written format and forwarding them to ACD for broadcast on national radio. The RCUs could perform a very valuable role of regional reporters for the national radio programme. If phone connections allow, perhaps they could phone-in stories, which could be recorded and used in ACD's programming.
- **Gathering raw video footage** for use with farmers in other locations, and for forwarding to ACD or the local Nepal TV station for editing into finished programmes. This is the most problematical of the functions because of the equipment and training problems outlined above. If efforts to develop this capability are not successful, ACD should consider dropping attempts to produce video in the RCUs and seek other ways of generating video material (such as posting an experienced two-person video team in one or two key locations, or improving the mobility of the existing Kathmandu-based ACD video team).
- **Drama.** In the longer term, it may be possible to develop the use of drama (street theatre, puppetry, etc.) as an important extension technique. The RCUs could be the focus of such efforts, coordinating visits by outside drama groups in collaboration with district offices and NGOs. It would be interesting to explore this possibility further with the several NGOs experienced in drama in Nepal.

Relationship with livestock directorate. ACD should ensure closer cooperation between regional agriculture and livestock directorates in communication activities. The RCU budget should be transparent to both directorates. Part of the RCU budget should be earmarked to provide incentives to individuals who write script material and assist in broadcasts. An appropriate portion of air time should be allocated for each major agricultural sector to ensure a better balance in subjects broadcast. The RCUs should be similarly open to information from other actors in the agricultural knowledge system, especially NGOs operating in their localities.

Market prices. The RCUs should broadcast the prices of key farm commodities in important local markets each week. This is already done for Kathmandu's Kalimati market through the Agricultural Marketing Board. Efforts should be made, in coordination with the AMB, regional communication units, district agriculture and livestock offices and regional Radio Nepal stations, to collect and broadcast prices of major traded commodities in key markets throughout Nepal. Weekly price information is already collected by district offices; it should be easy to gather such information by fax in the regional communication units, and include a brief bulletin at the end of each weekly programme giving these prices at one or two key market centres. These bulletins should focus on the 5–6 main commodities for which prices vary considerably (probably vegetables and poultry) in the 1–3 main markets in the region. A possible format for gathering and broadcasting this information is given below.

Computers and email. The RCUs (or the regional agricultural directorates that host them) should be provided with a computer and email service to ease communication with ACD, NARC and other actors in the agricultural knowledge system.

Development Communication Training

Specific skill-oriented training is identified as high priority action to be taken to improve the quality of ACD, Regional Communication Units (RCUs) and NARC's Communication unit's (CPDD) agriculture communication output and services. The communication training needs identified are:

1. Science writing and editing course for NARC's CPDD and Regional Communication, Publication and Documentation Unit (RCPDU) staff.
2. Librarianship training for CPDD and RCPDU staff.
3. PowerPoint (software) running and computer-based video projection for CPDD staff.
4. In-service training for ACD's radio and video unit staff, especially on video magazine production, advanced video editing (digital editing), radio magazine and drama production.

5. Writing and editing extension publications for ACD's print unit and RCU staff.
6. Desk-top publishing and graphic design for ACD's print unit and CPDD's staff.
7. Development communication and media production techniques for ACD, CPDD, RCU and RCPDU management-level staff.
8. Radio script writing and programme production techniques for RCU staff.
9. Video camera operation and basic techniques on video production for RCU staff.
10. Press and printing technology course for ACD's press operators

Nepal Agricultural Research Council

NARC Publication

CPDD should hire an additional science editor and procure at least two additional computers for editing and publications work. This would enable it to speed up its publication process and clear the current backlog of publications awaiting editing.

CPDD editors should have skills in scientific editing (in both English and Nepali), desktop publishing and computer operation. They should be familiar with agricultural science. Suitable qualifications are a minimum of a bachelor's degree in journalism or communication (preferably a master's degree), or a BS in agricultural science with additional training (eg, an MS) in communication).

NARC Central Library

Restore the electronic library catalogue as a priority (re-entering the data if necessary), and a system of backups instituted (using zip disks or a CD-ROM writer) to eliminate the possibility of another crash destroying the database.

Information search. Train all NARC scientists, including those at remote sites, in searching the AGRIS/CARIS databases. Provide a computer (or computers, should demand warrant) and printer in the library, dedicated to serving users: searching the NARC library catalogue (once this is restored), searching AGRIS/CARIS, using other CD-ROM resources, searching the Internet, etc. Provide a mechanism for scientists to obtain the full text of articles they have identified—for example, by pre-printing postcards to request reprints of articles (see under *Requesting information from outsiders*).

Journal and publication accessions. NARC should attempt to increase the number of journals and other publications (such as symposium proceedings and books) in the library collections. This can be done in various ways:

- **South Asian publications.** Many journals and books published in India and Bangladesh are high-quality, very relevant to conditions in Nepal, and a fraction of the price of equivalent publications from the developed world. NARC should focus its publication-acquisition here rather than on prestigious, high-cost, low-relevance Western materials.
- **Publication exchanges.** NARC's annual reports, conference proceedings and other technical publications could be exchanged for similar publications from other institutions.
- **Free publications.** Some organisations, especially international research centres, are able to donate a certain number of their publications to national research institutions such as NARC. NARC already receives some of these. The NARC library should identify other such organisations and ask to be

added to their mailing lists, and should lobby to increase the number of copies of publications from existing donors. NARC scientists who receive such publications on a personal or ex-officio basis should be encouraged to deposit them in the library.

- **Used publications.** Organisations exist in the USA and (we believe) in the UK that ship surplus copies of publications to deserving organisations. One such scheme receives donations of books and journals from retired university professors in the USA, and ships them at little or no cost to libraries in the developing world. NARC should identify such organisations and seek their assistance.
- **Book donors.** CTA, an intergovernmental organisation in the Netherlands, publishes a wide range of agricultural publications, many of which may be relevant to Nepal. While Nepal lies outside CTA's mandate area (Africa, Caribbean and the Pacific), it is possible that CTA would entertain NARC requests for its publications. Certain donors, such as the British Council, the US Information Service and the Asia Foundation, may be able to assist libraries to strengthen their collections. The NARC library should identify such organisations and seek their assistance.

Library staffing. The post of CPDD librarian is currently vacant. This position should be filled as soon as possible, and training should be provided to upgrade the existing library staff. Such skills upgrading is vital if the library is to improve its services to NARC scientists, both in Khumaltar and at outlying sites.

CD-ROMs

Obtain CD-ROMS. The NARC library should identify and obtain relevant CD-ROMs. Sources likely to be of particular value are the CGIAR centres and other international research institutions.

Train users in CD-ROM use. As with the Internet, library staff should make regular presentations on these information sources to NARC scientists.

Separate information access and data entry. As far as possible, separate computers should be used for data entry and for information access. Data entry (eg, entering catalogue information, revising the NARC website, and editing and desktop-publishing) should be done on a different computer from that used for accessing information (eg, consulting the library catalogue, searching the internet, or searching CD-ROMs). This would ensure that a computer is always free for users to search, data-entry work is not interrupted by users, and there is less likelihood of data corruption by inexperienced users (since the most recently updated version of the catalogue is on a separate computer).

Email and Internet

Email

Provide email access. NARC should aim to provide every scientist with access to an email-capable computer, and should provide each person with his/her own personal email account. It can do this by establishing a server-based local area network in NARC headquarters, providing email services and accounts to computers within NARC and outside. This would allow NARC to establish its own domain name (eg, narc.org.np), allowing it to allocate separate email accounts such as umishra@narc.org.np and potato@narc.org.np. This network could be run by NARC itself, or subcontracted to an outside company with the requisite skills. It should be coordinated closely with plans to establish a local telephone exchange (PABX, see under *Telephones*).

Such a network is likely to be fairly expensive. Elements of an interim, partial solution include:

- Upgrading existing computers by adding modems, phone connections and obtaining email accounts.
- Ensuring that new computers are equipped with modems, phone connections and email accounts.
- Providing email (and internet) capabilities to open-access computers in strategic locations, such as the library and in each division and remote site.

- Using these computers to establish free, internet-based email accounts (through, eg, Hotmail.com, Yahoo.com) for staff.
- Negotiate with an internet service provider (such as mos.com.np or wlink.com.np) for a separate domain and multiple email accounts on the remote server, then dial into these accounts from email-capable computers based at NARC.

CPDD should maintain a central database of email addresses, both of NARC staff and relevant outsiders, make this database freely available to NARC staff, and ensure it is regularly updated on all NARC computers (this is much easier through a server-based network).

Training. NARC staff should be trained in how to use email and be provided with a list of useful email addresses.

Internet

- Making an Internet-capable computer and dedicated phone line available for visitor use.
- Assisting users in searching the Internet (this is vital in view of the limited computer capabilities of many NARC staff)
- Providing a search service for staff at remote sites who cannot visit the library themselves.
- Identifying useful Internet sites, such as:
 - Online directories and search engines (library staff should be familiar with how to use them).
 - Catalogues of libraries of universities and research institutes abroad.
 - Online versions of research publications, available at many university and research institute websites.
 - Other sites containing the full text of development publications, such as the Humanity Development Library (<http://payson.tulane.edu:8888/>).
- Publicising the existence and contents of key sites among NARC staff.
- Making regular presentations on Internet search capabilities to NARC staff.

Exhibits

Focus of exhibits. Exhibits should focus on fewer, strategically chosen subjects: perhaps they could be given a theme (possibly related to the Agriculture Sector Plan), and items and messages chosen to fit within that theme. For example, an exhibit with the theme "New crop technologies for the Terai" might feature NARC-developed varieties and pest-management methods, but would not contain information on livestock or crops grown only in the hills. Exhibits should be revised and updated regularly; items can be rotated as required to provide variety.

Portable exhibits. CPDD should develop a portable exhibit that can be taken to remote locations (such as research stations). Lightweight, folding portable display boards are available from several manufacturers, but they are expensive, so are probably not appropriate for NARC's limited budget. A cheaper alternative is a suitable piece of plain cloth, which can be pinned up and used as a background for photographs and text, mounted on cards or foamboard, affixed to the cloth with Velcro hooks. CPDD should develop the capability to produce such exhibits both for NARC as a whole, and on request for individual divisions and scientists. This capability requires the following:

- Computer and laser printer to produce text.
- Enlarged photographs (can be made by commercial film processor).

Foamboard, card, glue for mounting, strips of Velcro hooks, suitable fuzzy cloth to hold hooks.

Computer

Common software. NARC and Ministry of Agriculture computers should use a common set of software. Because of its near-universality, Microsoft Office should probably be adopted as the standard, with Outlook as the email program. Such standards greatly ease information exchange, upgrading and staff training.

Computer skills. NARC should expect all its scientists to become computer-literate. They should acquire basic skills word processing, spreadsheets, data analysis, email, information search via the Internet, file management and virus protection. NARC should provide them with training in these skills. Scientists should be expected to perform most of their own computer work themselves, not to rely on the services of lower-ranking computer operators. Eventually, only complex tasks such as combined statistical analyses and desktop publishing should be performed by specialised staff members.

Computer availability. NARC should aim to increase the number of computers markedly, especially at outlying stations. Priority in allocating new computers should be given to those stations currently without one.

Security and maintenance. All computers should be adequately protected against power cuts, spikes and dropouts (stabiliser, surge protector, uninterruptible power supply) and viruses (regularly updated virus scanner such as McAfee). One staff member in each unit should be designated as the "computer guru", and be given the responsibility to maintain the computer, troubleshoot problems and, if necessary, regulate access. This person should be given the training required to perform these tasks.

Management. NARC should appoint a computer steering committee, composed of knowledgeable individuals, to oversee computer acquisitions, make recommendations on hardware and software issues, and develop policies on a NARC local area network and information technology unit (see below).

Information technology unit. As NARC's computing capacity grows, it will become necessary to create a special unit to manage it. This should cover all aspects of computing and telecommunications, and should be closely related to the CPDD, biometrics and management information systems services.

Web site

Publicise the site more widely, for example by registering the site with search engines, adding the web address to all NARC business cards, stationery and publications, and producing a flyer advertising the site, to be inserted into correspondence, given out to visitors and distributed at conferences.

Add information to the site, such as abstracts and the full text of research papers, and a searchable staff directory, containing staff names, job titles, departments, and contact details.

Add a monitoring and feedback capability. Add a counter and hit monitor to record the number of hits and their location. This would enable NARC to discover the number of people accessing the site and their location. Add an email feedback form to enable users to send questions and comments to NARC.

Improve the site design. Revise the design to make the contents more easily accessible. Add an ftp (file transfer protocol) capability within CPDD, enabling updates to be made more easily and frequently (this is currently done with the help of ICIMOD). Correct the occasional error in design, caused by transferring from Word files to HTML.

Site hosting. Even if NARC establishes its own server (see above), the website should probably be hosted outside (eg, by panasia.org) because this will offer much higher bandwidth (and so shorter download times) than a server at NARC could.

Training. The CPDD staff member (K R Bhatta) responsible for desktop publishing and maintaining the website appears to be self-taught. While he has done an admirable job in both these areas, he would clearly benefit from some formal training in both PageMaker (desktop publishing) and in website design (possibly FrontPage).

Outlying NARC Stations

Library. Outlying station libraries should be provided with key references (such as ICRISAT cowpea publications for those stations primarily responsible for this crop). The availability of information in these stations can be greatly improved using the approaches described above under *CD-ROMs*, *Email* and *Current contents service*.

Communication officer. One or two staff in each centre should be designated as communication officers. They should be provided with training in development communication skills (eg, at the proposed IAAS course). They should be given the task of coordinating and implementing communication and outreach activities at their station. These tasks may include managing outreach research and demonstration sites, collaborating with CPDD to generate, edit and produce information materials such as brochures, annual reports and research briefs, and managing the station library.

Email. The outlying stations should give high priority to developing their email facilities. For centres without adequate telephone lines, it should be possible to make an arrangement with a local business to forward and receive emails for a fee. In Nepalgunj, for example, two businesses advertise email service: the Bheri Technical Institute and Ocean Computer, and may be able to provide such services to the telecom-deprived NARC station.

NARC ACD Linkage

More proactive promotion of significant research findings by NARC (and CPDD in particular). CPDD and relevant NARC scientists should put constant pressure on ACD to include their findings in ACD outputs, and should feed ACD with a stream of articles, research briefs, phone calls, visits and (eventually) emails with information to put into ACD media.

Proactive seeking of new information by ACD. CPDD's list of *Technical inputs as extension messages* is an excellent starting-point for ACD staff to probe in a journalistic manner for more information from the relevant NARC scientists.

A revised reward system (including promotion and financial incentives) for NARC scientists for writing extension articles, providing radio or TV interviews, etc. ACD could be given a small amount of funding to pay individuals for providing such information, and authorship of extension articles and appearances in the media could be added to the considerations used in NARC's staff evaluation and promotion procedures.

Joint workshops (co-managed by ACD and CPDD), involving researchers, extensionists and NGO staff, to develop information materials. Such workshops could be held regularly (perhaps every 3 months, and on a regional or commodity-specific basis) to develop new extension materials. We propose to implement such a workshop during the next phase of our consultancy (see *Action plan for next phase of consultancy*).

Institute of Agriculture and Animal Science (IAAS)

As a start along this road, and in order to satisfy the immediate demand for trained personnel in development communication, IAAS should offer a 2-week intensive short course on agricultural communication and media strategies. This course could be offered initially to selected staff of ACD, CPDD, the central agricultural training centre, and the RCUs, as well as faculty members and future trainers in development communication from IAAS itself. The course would combine applied theory in communication with hands-on practical exercises in writing, editing, video and radio scriptwriting and production. It would be ideal if IAAS could procure sufficient video and audio equipment in time for this course (it is likely that sufficient computers are already available on the IAAS campus to allow some teaching of writing and editing skills).

We propose in our next consultancy input to teach (in collaboration with IAAS faculty members) to plan and teach an initial 2-week intensive course in this series.

The intention would be for IAAS then to develop the course further, and to adapt it both as a course for degree credit and as a short course for staff of ACD, CPDD, RCUs, the central and regional agricultural training centres, the vocational agricultural training schools, regional and district agricultural and livestock offices, NGOs and other organisations involved in agricultural and rural development in Nepal. Relevant parts of the course could then be cascaded through the vocational schools and central/regional training centres.

In order to run such courses in the future, IAAS media production and teaching facilities would need to be strengthened. In particular, IAAS would need the following facilities:

- IAAS would need outside support to purchase most necessary equipment and physical facilities for establishing the proposed media lab and printing unit. We have recommended a list of most necessary equipment for the media lab in our earlier report. This is presented here too with inclusion of some additional ones (see annex 6 in consultant's September report).
- Print: Computers, printers, scanner, process camera, platemaker, offset press (medium duty), guillotine machine, stitching machine etc.
- Audio: Audio recording and editing studio, several portable cassette recorders, microphones, editing console
- Video: A few VHS cameras for students' hands-on use, at least one Betacam (better to have two) camera and editing system for Betacam format, DC light pack and studio lighting system.
- Photography: 35 mm cameras, enlargers, dark room to be strengthened.
- Video projection system (LCD Data Projector) for teaching as well seminar presentation

IAAS departments of Agriculture Extension and Rural Sociology should find suitable place with adequate space to home these equipment and operate them effectively. It also has to develop a workable norm to generate and revolve fund for its sustainable operation and maintenance.

Workshop to produce information materials

We propose to run a joint ACD/CPDD workshop to produce extension information materials. This one-week workshop will involve NARC scientists, NGO staff, IAAS and extension staff, and the publications staff from ACD, CPDD and IAAS. It will have several purposes:

- To develop a set of extension information materials on agriculture in Nepali, for use by extension personnel in the Departments of Agriculture and Livestock Services.
- To develop a new mechanism for research-extension linkages that can be used by the Agriculture Communication Division (ACD) and the Nepal Agricultural Research Council (NARC) in the future.
- To train ACD and NARC communication staff and NARC scientists in how to develop user-friendly extension materials.
- To improve linkages among NARC, ACD, the Ministry of Agriculture and NGOs working in agriculture in Nepal.