Evaluating Internet for Extension in Agriculture (1997)

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Summary

Effective adoption of Internet for extension in agriculture is elusive despite substantial investments in human capital and other resources. To better understand the adoption process EUNITA (a concerted EU project www.eclipse.it/EUNITA/main.html), INEA (the Italian National Institute of Agricultural Economics - www.inea.it) and the Toscana Extension service sponsored a workshop in Alberese, Italy to evaluate critical success factors and failures. A summary of participant's opinions indicated general agreement on benefits such as:

Updated and comprehensive information; availability of new types, "Just in time", more and competing information sources; "One stop information shopping"; ease of exchange of information and/or ideas and facilities to discuss them; easier collaboration and /or access to peers, other farmers and experts; a ranked list of useful information such as updated market lists, weather information, plant protection regulations, recommendations and products, news, bulletins, and more;

There was general agreement relating to critical success factors such as:

Internet accessibility on individual farms or at farmer-gathering locations; inputting of information that farmers/extension want and/or need; identifying a tangible benefit to information users; defining and serving target audiences; packaging information in a way that it can be understood and applied; a simple, user-friendly search engine and interface design; responsibility for the information quality and reliability; revealed preference as a guiding factor for Internet development.

Going deeper into the summary of detailed participant's opinions provides a practical, baseline, reference for Internet adoption planning,

program implementation and goal achievement evaluation. An abridged version of this summary was published in the December 1998 issue of the Journal of Agricultural Education and Extension.

Introduction

Agricultural production is becoming ever more dependant on Information Technology (IT). Although IT is relatively easy to adopt and cost effective its' adoption is not straightforward and initially can even be counter-productive. The explosive presence of Internet on the IT scene and the rapid adoption of Internet supported activities have created a wide range of opportunities and expectations. Internet for Agriculture in general and extension in particular are no exception. Extension providers' and client expectations include superior information accessing and dissemination, EDI, ongoing farmer-extension-research communications - in effect with online effectiveness, better knowledge management, real and "just-in-time" information updating, discussion forums, integration of information sources, improved extension delivery, extension service organization and more. As is often the case with technological-innovation potential and expectations can outpace reality. Adoption is usually not spontaneous, the technology has to be taught and learned - adopted to existing experience and integrated into e.g. production. Specific environments dictate specific solutions, which have to be developed, alternatives - past and present including "resistance to change" can be impediments. These and many other reasons stand in the way of innovation-adoption with Internet for agriculture and extension again not being an exception. By the same token adoption of Internet must be studied and understood in order to define trends, areas of cooperation, unique issues and priorities. This last point is especially relevant due to the relatively low cost of Internet entry compared to the very high cost of maintaining relevance and the uniqueness of country specific solutions. In order to study the adoption of Internet for extension for agriculture an international workshop was organized in Alberese, Italy to examine various aspects of the adoption process. It was hoped that the outcome would provide participants and practicing professionals with useful pointers for their activities. The results of deliberations and discussions held at the workshop are reported.

Workshop Background

The Alberese workshop was geared to assess Internet adoption via nine major evaluation categories - the detailed program is available at www.inea.it/eventi/workshen.htm. Workshop participants came from Italy, England, Denmark, Portugal, Spain, France, Holland, Belgium, Germany, Finland, Sweden, Ireland, Israel, Austria, Greece, Canada, Australia and Brazil.

All were professionally involved in Internet and Information Technology in agriculture.

The participants were divided into workgroups and requested to raise subjects that they considered important. They were then asked to study these subjects within workgroup discussions. 23 participants from the above countries were then asked to score the importance of individual subjects discussed. 3 was the score for what the respondent considered a very important subject, 1 was the score for a subject that was just important enough to be brought up and discussed in a workgroup. Others in between were scored with a median 2. In this manner the maximum score a "discussed subject" could aggregate was 69 (23 participants x 3; a score of 55 represents 80% of the possible 69 points). Their evaluations focused on current Internet adoption issues in the above countries' agricultural sectors. The full list of subjects discussed and each subject's scoring are appended. Further details are available from the authors.

An index is shown in each of the following evaluation category's title. The index numerates how many subjects in each category were scored by the 23 participants to be "very important" by scoring it with a 3. A similar index is shown for each individual subject **within** each category and placed in parenthesis. The maximum possible score per subject is 69. The maximum number of respondents is 23. For reference 18 represents 80% of the respondents. This methodology reports the number of subjects that participants thought worthy of discussion, a score of each subject's relative importance and an indication of participant's agreement. A detailed example follows:

There were 19 subjects discussed in Category 1 (re Category 1 title). Of these 19 subjects only two subjects received a score of 55 or higher (two from nineteen - 2/19 - re title index). These two ≥ 55 subjects are reported under the Category title and scored as follows: the 23 participants gave the first subject an overall score of 58. 15 participants (out of the 23) scored it with a 3 ("very important") therefore the notation 58(15). This score is "high" as judged by more than half the participants (15 from 23) to be "very important". The second subject scored 55 with 12 participants scoring the subject as very important therefore 55(12) - again with more than half the respondents giving it a very "important" rating. Following are the ≥ 55 results listed for each of the subjects raised and discussed in each of the nine evaluation categories. Table 1 summarizes the results that can be viewed as a "consensus index". A rough rule of thumb can be e.g. "if about or more than half of the subjects in a category reached ≥ 55 there is a high level of agreement that this category is very important for adoption of Internet in extension". In the case of category 1 only two subjects - see details below - fit this description. The result should be interpreted as showing a relatively low level of agreement in the category. The same should be concluded for both subjects both being with a score of <60. It is just as important to note that the 13 subjects that scored <50 in Category 1 were identified by at least one participant(co) as a technical problem

but were not seen as such by the majority. For example only one country identified its' telephony network as a limiting factor.

Table 1: Summary of subject-scores by category

Category	Number of subjects	Scores ≥ 55	Scores 50-54	Scores <50
1	19	2	4	13
2	14	7	4	3
3	8	2	0	6
4	22	13	2	7
5	11	1	3	7
6	9	0	3	6
7	14	7	4	3
8	15	4	5	6
9	9	1	7	1

A cursory review of the above results suggests that in three categories there is **substantial agreement** on the relative importance of subjects discussed. (**Agreement and substantial** are defined as a high ratio between the number of subjects discussed in a category and the number of subjects that had a ≥ 55 score and the ratio of subjects scored '3'). These categories are 2. User benefits from using Internet (7 out of 14 replies were scored ≥ 55); 4. Critical success factors (13 out of 22) and 7. Knowledge gaps relevant to Internet (7 out of 14). In the other categories there is a much lower level of 'agreement' as defined. The operative conclusions for extension from this "consensus index" are probably unique, certainly with different implications, for each country and Extension service. The full details of the scorings follow. The accompanying comments are the authors alone and should not be considered a formal result and/or a recommendation. Readers will most probably and are expected to interpret the results with their personal and country bias. The fact that all the results are opinions and should be viewed with proper reservation cannot be overemphasized.

Review of high scoring (≥ 55) subjects by Category and subject

1. TECHNICAL PROBLEMS ADOPTING OR USING INTERNET FOR EXTENSION (2/19)

The basic issue of this category was the extent of technical problems as a factor limiting Internet adoption and operation. The results did not identify agreement on a significant number of problems. This in turn indicates that major technical problems where identified are probably country or locale specific. Only two subjects received a ≥55 score with a moderate level of agreement. They were:

Sites untested for farmer needs, friendliness, technical attributes, etc.
58(15)

Level of supplied information incompatible with farmer's level of
production technology. 55(12)

2. USER BENEFITS FROM USING INTERNET BY EXTENSION/FARMERS (7/14)

Half of the identified benefits reached a ≥55 score. 14 however reached a high level of agreement (>60). The identified issues closely followed the situation in each country and the alternatives available to farmers, extension and research. There was a much higher degree of agreement what the benefits can and should be as demonstrated in the first following subject in this category.

Updated and comprehensive information. 67(21)

Availability of new types of information - in addition to extension's
field of competence. 56(12)

"Just in time" information. 67(22)

Access to more and competing information sources. "One stop
information shopping". 55(12)

Easy to exchange information and/or ideas and discuss them. 63(17)

Easier to collaborate with and/or access peers, other farmers and
experts. 60(16)

A ranked list of useful information: updated market lists, weather
information, plant protection information and products, news,
bulletins. 55(16)

3. DRAWBACKS FROM USING INTERNET FOR EXTENSION (2/8)

Only 2 subjects were identified as "drawbacks". 6 were not. One
reason could be that experience with Internet for extension is still
limited - with the drawbacks yet to be universally recognized.

Too much (possibly contradicting and/or non-focused) information.
58(15)

Unreliable or outdated information. 58(14)

4. CRITICAL SUCCESS FACTORS FOR EFFECTIVE INTERNET USE (12/22)

This category had the highest level of agreement. It is not surprising considering the fact that workshop participants are all involved intimately with the workshop subject matter. What is surprising is the fact that there were subjects that some considered critical success factors and others did not. As shown in the appendix details they did not even reach a "low scoring" rating. "Finding out what information the farmer wants and needs" scored very high with an almost universal agreement - as compared to current situations providing only "available" and/or "official" information.

Internet accessibility on individual farms or at farmer gathering locations. 59(16)

Find out what information the farmer wants. 65(21)

Find out what information the farmer needs. 65(20)

Find out what information "extension" needs. 61(17)

Identification of a tangible benefit to information users. 57(16)

Identify the information's target audience. 59(15)

Package information in a way that it can be understood and applied. 62(17)

A simple interface and easy to navigate search engine. 58(14)

Someone has to be responsible for the information quality and reliability. 61(17)

Credibility/reliability. 58(15)

Updated information. 63(18)

Realize that a site must provide professional information and not just presence. 63(17)

5. ORGANIZATIONAL ASPECTS AND NETWORKING RESPONSIBILITIES (1/11)

Only one subject was universally agreed as having an important organizational impact. This may be the result of short experience with Internet implementation and organization specifics. Experience in other activities indicates that adoption

of IT has a profound impact on organizations. There is no reason to assume that organizations dealing with extension delivery will be immune.

There is a need to define the role of the extension officer as part of the new Internet options. 57(13)

6. OBSTACLES TO USE OF INTERNET (9)

There were no subjects that reached the score of ≥55!!!

7. KNOWLEDGE GAPS AND NEW TRENDS RELEVANT TO INTERNET (6/14)

The agreement and scores in this category are relatively high. They reflect the fact that with experience knowledge gaps and trends become apparent. The subjects that were discussed and did not reach the "low scoring" rating - see appendix - perhaps indicate country specific issues.

There is a need for local (versus "global or average") knowledge. 57(14)

There is a need for identifying the practical aspects of research results. 61(16)

PCs should be viewed as communicators as well as "advanced calculators". 60(16)

Interactivity will become ever more important and feasible. 57(14)

Demand will become a more important factor in prioritizing the development of services available via the Internet. 59(14)

Use and friendliness will facilitate easier and more efficient use of Internet. 56(12)

8. PROPOSED AND/OR POTENTIAL PROJECTS FOR DEVELOPMENT (4/15)

 The high scoring of the 4 agreed subjects probably reflects the characteristics of the workshop participants. Casting a wider net would possibly result in having more subjects suggested and eventually included as important.

An international exchange of extension Internet professionals - at least at discussion group level. 61(15)

EFITA (The European Federation for Information Technology in Agriculture) should start a forum to communicate "What's going on" and ideas. 61(15)

Establish an inventory of extension projects and sites and make them available on the Internet. 61(14)

Establish and agree on standards for data exchange and development. 56(13)

Only one out of the nine issues discussed past the ≥55 criteria. Both indices - the low number of subjects and the agreement level initially suggest the immaturity and country specificity of the raised adoption issues. A closer look at the issues scored ≥ 50 clearly demonstrates their recognition and depth of adoption implications. They are a good indication of subjects that will command effort priority in the future.

Integration of Internet in agricultural schools and training as a research tool. 57(15)

Review of lower - scoring (<50) subjects

Some subjects that were assumed a priori in workgroup discussions to be very important received unexpected low scores. They are listed by evaluation category. Comments follow.

1. TECHNICAL PROBLEMS IN ADOPTING OR USING INTERNET FOR EXTENSION

There are no technical problems in adopting use of Internet for extension. 32(3)

Outdated computers. 3(3)

Care detrimental to development of Internet infrastructure. 41(8)

Overload on rural communication facility's capacity during peak demand. 37(5)

2. USER BENEFITS FROM USING INTERNET BY EXTENSION/FARMERS

The user has a sense of "belonging". 45(8)

Informal meeting place. 45(4)

Fun. 41(6)

3. DRAWBACKS FROM UINTERNET FOR EXTENSION

An over dependence on "one" source of information. 38(4)

A need for a "middle man" (e.g. extension person) to interpret Internet information. 46(10)

Information supplier's lack of accountability. 40(5)

Unidentified and/or ignored invisible costs. 41(5)

Internet use is not compared to costs and benefits of alternative information options. 40(5)

"Abandoning" farmers to the Internet. 38(8)

4. CRITICAL SUCCESS FACTORS FOR EFFECTIVE INTERNET USE

5. ORGANIZATIONAL STRUCTURE ASPECTS AND NETWORKING RESPONSIBILITIES

Internet information facilities may change existing organizational structures. 46(7)

Other than extension information providers may have to restructure. 44(5)

Alternative information entities may establish themselves e.g. a Farmers' Union Extension service. 42(5)

6. OBSTACLES TO USE OF INTERNET

Farmer's resistance to change. 41(5)

Culture and tradition. 39(4)

Alternative sources of information. 42(5)

Extension's competitors. 33(1)

7. KNOWLEDGE GAPS AND NEW TRENDS RELEVANT TO INTERNET

8. PROPOSED AND/OR POTENTIAL DEVELOPMENT PROJECTS

Establish standards for training and supporting the creation of Internet services. 44(9)

Commercialize as a way to sustain web services. 45(6)

9. ISSUES DISCUSSED

Women may have different needs, uses and perspective on Internet services. 39(3)

How can products and project ideas be developed and used as a source for new sites and services. 47(9)

The above contradictions of convention and their significance are hard to explain. For example only 3 participants considered "technical problems in adopting Internet for extension" to be very important; only one participant considered "Extension's competitors as an obstacle to Internet adoption" very important; only 5 out of the 23 respondents thought "....compared costs and benefits of alternative information options" is a very important factor as are the hidden costs

of Internet use. The low score that "Fun" received is inexcusable. Category 6 results can probably be explained by country differences which go a long way to explain the others.

ADDITIONAL ISSUES DISCUSSED

Other subjects were discussed in the workgroups and workshop sessions but did not appear in the scoring. Following is a brief summary of some of them:

It is difficult to relevantly focus the definition of an Internet "end-user" due to the interchangeability of roles and assignment of costs and benefits, e.g. a farmer will be a recipient of disseminated information from extension which generated the information by collecting data from farmers. The farmer/extension-officer here are end users, information generators and beneficiaries, etc;

There was general recognition of the high Internal Rate of Return to public sector investment in Information Technology infrastructure - in general and for the rural sector. It would be useful for agriculture in particular to have measured benefits to support this view and sectorial priorities for resource allocation;

The influence of "rural" involvement on "urban" politics can be substantial. A sense of belonging and interaction between both is facilitated by the use of Internet;

The human factor is a strong motivating force for Internet adoption - e.g. children and Internet buff's impact. This observation has yet to be quantified;

The present methodology of Internet use is transitional. Wireless transmission and greater interactivity, with innovative I/O devices are here. Their derived implications for agriculture, e.g. for on-line precision farming, are yet to mature;

Past experience with videotex shows that (conceptually) being an attractive substitution to print is not enough to sustain an information dissemination technology over time. Regardless of Internet's phenomenal success the technology, its implications and chances for survival are far from being understood;

Extension Services are undergoing structural changes. Internet use will help to adapt, facilitate and even cause these and other changes, e.g. "flattening" the organizational structure. Extension will also have to adopt to Internet's influence on the increasing disparity between technology-innovators (agents of change) and innovation-followers, the weeding out of inefficient producers and their dependence on the public sector;

Farmer organizations play an important role in Internet adoption, provision of subject matter content and funding for information generation and dissemination. The organization's goals do not always correspond to individual member's goals;

The economics of Internet use in agriculture are there to be researched. This is becoming an issue of some urgency due to the high penalty imposed by non-focused Internet use, indirect "invisible costs", "too much" information and availability of cheaper information dissemination and communication alternatives.

DISCUSSION

Information gleaned from the summary, as presented, was found to be a useful tool for defining trends, identifying areas of agreement, unique issues and issues of common relevance. What was found by participants to be most productive was their by-country interpretation of the scoring, scrutiny of the subjects considered important, the number of participants that considered each subject 'very important' and relating these to personal experience. Repeating the 'interpretation-exercise' will enable each reader to benefit from the results in the same way. The main benefits are a "guide" for Internet adoption, implementation of extension, an agenda to evaluate existing Internet activities, pinpointed bottlenecks - current and expected, an indication of subject priorities and reference for a more focused evaluation of each subject's impact.

An additional approach to evaluate the results would be to replicate workgroup discussions within each reader's "Internet adoption" framework thereby directly benefiting from their **end-user's** input. This would provide a practical, baseline, reference for Internet adoption planning, program implementation and goal achievement evaluation. **End-users** would be **farmers** - as information users and information generators (opinions and field results); **extension personnel** - as information disseminators and information generators (field trials and "imported" know how); **agricultural researchers -** as information generators and information users (feedback from farmers and extension) and **service providers** such as packing houses, wholesalers, soil labs, agrometeorology services, veterinarians, equipment suppliers, and other sector information actors. The authors would be glad to assist in such iterations, their evaluation and implementation.

APPENDIX: FULL ITEMIZED SUMMARY OF WORKGROUP DISCUSSIONS WITH SCORING

The ranking of each item's importance for extension was on a scale of 1=not important to 3=very important. There were 23 workgroup participants in the survey. Each item has a score - e.g. for item 1.1 the score is 51 out of a possible 69 (3x23). 12 out of the 23 respondents ranked the item with a score of 3. (For reference an item score of 62 represents 90%, 55 represents 80% and a score of 50 represents 72% of the maximum score of 69; 21 out of 23 respondents represents 90%, 18 represents 80% and 14 represents 60%). Bold letters indicate the subjects' inclusion in the "high scoring ≥55" rating.

1. TECHNICAL PROBLEMS IN ADOPTING OR USING INTERNET FOR EXTENSION

1.1 Training farmers in the technical aspects of using Internet. 51(12)

1.2 There are no technical problems in adopting use of Internet for extension. 32(3)

1.3 It is difficult for extension services to build advanced programs for farmer and/or other users when other high speed communications are not available. 50(11)

1.4 The "speed of the net" for whatever reason. 46(5)

1.5 Security of the information provided. 48(8)

1.6 Payment for usof Internet services. 54(13)

1.7 Few for informa- hard to be free of vendor standards. 44(6)

1.8 Unfriendly site design. 46(5)

1.9 Sites untested for farmer needs, friendliness, technical attributes, etc. 58(15)

1.10 Level of supplied information incompatible with farmer's level of production technology. 55(12)

1.11 Lacking of understanding of need for good telecom policy and facilities. 45(2)

1.12 Lack of individual learning ability, learning programs, etc. 42(5)

1.13 Few reliable software for finding information and/or managing it. 39(5)

1.14 Files that are "too large" to manage, ingest or use efficiently. 41(6)

1.15 Difficult to find the information that is needed - easy to find information that is prompted. 53(13)

1.16 Farmers pay "Internet use" fees while extension officers (as public officials) do not. 34(4)

1.17 Outdated computers. 38(3)

1.18 Communication monopolies that are detrimental to development of Internet infrastructure. 41(8)

1.19 Overload on rural communication capacity during peak demand for communications. 37(5)

1.3 It is difficult for extension services to build advanced programs for farmer and/or other users when other high-speed communications are not available. 50(11)

1.6 Payment for use of Internet services. 54(13)

1.9 Sites untested for farmer needs, friendliness, technical attributes, etc. 58(15)

1.10 Level of supplied information incompatible with farmer's level of production technology. 55(12)

1.15 Difficult to find the information that is needed - easy to find information that is promoted. 53(13)

2. USER BENEFITS FROM USING INTERNET BY EXTENSION OR BY FARMERS

2.1 Lower costs for information retrieved from the Internet. 54(11)

2.2 Updated and comprehensive information. 64(21)

2.3 Availability of new types of information - in addition to extension's field of competence. 56(12)

2.4 'Just in time' information. 64(22)

2.5 Access to more and to competing information sources. 'One stop information shopping'. 55(12)

2.6 Easy to exchange information and/or ideas and discuss them. 61(17)

2.7 Easier to collaborate and /or access peers, other farmers and experts. 60(16)

2.8 A tool for distance learning, training and consultation. 52(10)

2.9 A ranked list of useful information: updated market lists, weather information, plant protection, news, bulletins and plant protection products. 55(16)

2.10 An instrument to connect to the "outside (non rural) world". 50(8)

2.11 The user has a sense of "belonging". 45(8)

2.12 Provides access to markets, services and shopping. 53(7)

2.13 Informal meeting place. 45(4)

2.14 Fun. 41(6)

3. DRAWBACKS FROM USING THE INTERNET FOR EXTENSION

3.1 Too much (possibly contradicting and/or non-focused) information. 58(15)

3.2 Unreliable or outdated information. 56(14)

3.3 An over dependence on "one" source of information. 38(4)

3.4 A need for a "middle man" (e.g. extension person) to interpret Internet information. 46(10)

3.5 Information supplier lack of accountability. 40(5)

3.6 There are invisible costs involved in Internet use that are usually unidentified and/or ignored. 41(5)

3.7 Internet use is not compared to costs and benefits of alternative information options. 40(5)

3.8 Abandoning farmers to the Internet. 38(8)

4. CRITICAL SUCCESS FACTORS FOR EFFECTIVE INTERNET USE

4.1 Internet accessibility at individual farm or farmer group locations. 59(16)

4.2 Find out what information the farmer wants. 65(21)

4.3 Find out what information the farmer needs. 65(20)

4.4 Find out what information "extension" needs. 61(17)

4.5 Identification of a tangible benefit to information users. 57(16)

4.6 Identification of a tangible benefit to information providers. 52(12)

4.7 Provision of information and/or a service unavailable elsewhere. 56(12)

4.8 Awareness. 40(8)

4.9 "Umbrella sites for facilitating easy use of Internet. 41(9)

4.10 Identify the information's target audience. 59(15)

4.11 Package information in a way that it can be understood and applied. 62(17)

4.12 Simplicity, good design and easy to navigate search engine. 58(14)

4.13 Someone has to be responsible for the information quality and reliability. 61(17)

4.14 Credibility/reliability of Internet use will have an effect on Internet application development. 58(15)

4.15 Updated information. 65(19)

4.16 Building the Internet site together with the end user. 50(9)

4.17 Realize that a site must provide professional information and not just presence. 63(17)

4.18 Fast lines to transfer the information. 49(8)

4.19 Integration of multi stake-holders vision and government policy. 42(4)

4.20 Low price for hardware, software and net use costs. 47(5)

4.21 Integration of information preparation and dissemination. 43(5)

4.22 Internet subject matter training for extension personnel. 47(12)

5. ORGANIZATIONAL STRUCTURE ASPECTS AND NETWORKING RESPONSIBILITIES

5.1 Less organizations and more network. 51(6)

5.2 Encourage innovators as part of a supportive political climate. 51(10)

5.3 There is a need for EU and national policies. 44(7)

5.4 There is a need to balance between Internet innovator's freedom and national policies. 36(3)

5.5 We have to use the extension structures that already are working. 49(10)

5.6 There is a need to define the role of the extension officer as part of the new Internet options. 57(13)

5.7 A high degree of development within the organizations has to be combined with networking

between organizations. 51(11)

5.8 Internet information facilities may change existing organizational structures. 46(7)

5.9 Other than extension information providers may have to restructure. 44(5)

5.10 Alternative information entities may establish themselves e.g. a farmer's union extension

service. 43(6)

5.11 Farmer organizations and extension services paid by them may not represent farmer needs. 45(9)

6. OBSTACLES TO USE OF INTERNET

6.1 Farmer's resistance to change. 41(5)

6.2 Culture and tradition. 39(4)

6.3 Extension officers may feel threatened by Internet services. 52(9)

6.4 Extension service decision-makers "misunderstanding". 41(7)

6.5 Extension service decision-maker's (manager's) fear of change. 48(8)

6.6 A "top down", "we know better" approach to provision of information. 50(10)

6.7 Alternative sources of information. 42(5)

6.8 Extension's competitors. 33(1)

6.9 Unsuitable packaging - language, misunderstood descriptions, nonstandard information, etc. 52(11)

7. KNOWLEDGE GAPS AND NEW TRENDS RELEVANT TO INTERNET

7.1 There is a need for local (versus "global or average") knowledge. 57(14)

7.2 There is a need for identifying the practical aspects of research results. 61(16)

7.3 There is a need for "prompts" for those who do not know "what" is available. 55(9)

7.4 How to integrate available information (e.g. a spraying schedule) with real time data. 54(9)

7.5 How to filter information. 51(6)

7.6 PCs should be viewed as communicators in as well as "advanced calculators". 59(16)

7.7 Internet could be used to "push" information in addition to providing information accessibility. 52(10)

7.8 Portable communicating devices will enhance Internet availability. 40(3)

7.9 Interactivity will become ever more important and feasible. 57(14)

7.10 Demand will become a more important factor in developing services available via the Internet. 59(14)

7.11 Use and friendliness will facilitate easier and more efficient use of Internet. 56(12)

7.12 Teaching and learning will become more self directed and focused. 47(7)

7.13 Teleworking and distant education will increase. 51(8)

7.14 Wireless communication may overtake wired facilities. 36(2)

8. PROPOSED AND/OR POTENTIAL DEVELOPMENT PROJECTS

8.1 Establish a study to learn lessons from past experience in similar media - mainly videotex. 48(12)

8.2 An international exchange of extension Internet professionals - at least a discussion group. 61(15)

8.3 Convince International Funding Institutes (FAO, IBRD, etc.) that the use of computers, which are already sponsored by them, should include Internet components. 49(8)

8.4 Build virtual organizations around projects and products. 51(9)

8.5 EFITA could start a pool for ideas and 'What's gon'. 61(15)

8.6 Establish an invof exteprojects and sites anmake them available on the Internet. 61(14)

8.7 Establish an inventory and tool for "frequently asked questions" at local and aggregate levels. 51(9)

8.8 Use the Internet as a tool to cooperate in developing different IT resources - Images, GIS, models etc. 54(10)

8.9 Use the Into facilitate solutions to language difficulties 45(7)

8.10 Evaluate standard procedures to measure the impact of Internet projects, use and services. 50(11)

8.11 Establish standards for training and supporting the creation of Internet services. 44(9)

8.12 Establish and agree on standards for data exchange and development. 56(13)

8.13 Support EFITA co-ordination activities in different Internet subject matter areas. 53(10)

8.14 Commercialize as a way sustain web services. 45(6)

8.15 Establish methods to measure the quality of telephone lines. 34(3)

9. ISSUES DISCUSSED

9.1 What information should be made available in the public domain for free as part of a public service and what information should be left to the market on a pay-per-access basis? 53(12)

9.2 Women have different needs, uses and perspectives on Internet services. 39(3)

9.3 The benefit of integrating Internet in agricultural schools and training as a research tool. 57(15)

9.4 A better understanding of how farmers make decisions will facilitate a better design of information services - via the Internet as well. 54(13)

9.5 Options for providing access to Internet in areas where not everyone has a communicator. Some ideas were tele-cottages, Internet clubs, shared communication

resources, public use of extension offices, kiosks in marketplaces, schools, public offices, libraries, and more. 50(13)

9.6 How to involve Internet information endusers in the development, design, and on-going maintenance of websites. 53(11)

9.7 How can critical evaluation of Internet-originating information be encouraged for example by end users such as farmers or extension officers? Such experience-based evaluation is equivalent to applied research - making end users in effect information providers. 51(10)

9.9 There is a need for funding of projects that need final, premarketing development fine-tuning. 53(12)

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