CIARD

Coherence in Information for
Agricultural Research for Development

Researcher Attitudes and Behaviour Towards the 'Openness' of Research Outputs in Agriculture and Related Fields

Philip Edge, Franz Martin, Stephen Rudgard (FAO), and Nadia Manning Thomas (CGIAR)

TABLE OF CONTENTS
page

Abstract

An online worldwide survey of researchers in agriculture and related fields was carried out in March 2011 by the CGIAR, FAO and GFAR on behalf of the CIARD (Coherence in Information for Agricultural Research for Development) initiative. The aim of the survey was to gain greater understanding of researcher behaviours and attitudes in relation to communicating research outputs and making such outputs open and accessible. There were almost 1500 responses to the survey, with 50% of respondents identifying that they worked in Latin America and 33% in Africa. The survey analysis shows that, although researchers are driven in their work by many different and interacting motivations, institutional/organizational factors are very important and have much influence over individuals' behaviour. Often, making a research output freely and openly available can be in the hands of the individual, and some will act in this way. However, for many others there are perceived barriers to this, such as the lack of required resources and of institutional policies to drive these activities. Further, current behaviours in choosing routes to communicate research results are still strongly biased toward the traditional routes of publishing in journals and books and appearing at conferences, though the availability and increasing use of digital formats is starting to broaden the spread of communication pathways used. The paper ends with reference to the relevance and importance to the CIARD initiative of the results of the survey.

Introduction and Objectives

The Coherence in Information for Agricultural Research for Development (CIARD) initiative (**http://www.ciard.net/**) is working to make agricultural research information publicly available and accessible to all. This means working with organisations and individuals that hold information or that create new knowledge - to guide them to disseminate it more effectively and make it easier to access. This means enhancing the 'openness' of knowledge for all.

The scope of CIARD's focus on research outputs is broader than that of the Open Access movement, which so far has tended to focus on the peer reviewed journal literature. It is worth noting however that large surveys have been carried out in the context of the Open Access movement which give valuable insights into researcher attitudes: for example the survey of about 54,000 researchers worldwide as part of the SOAP (Study of Open Access Publishing) EU-funded project in 2010.[1]

CIARD aims to stimulate the openness of all types of research output, including theses, images, data, grey material, and so on. Further, CIARD aims to stimulate innovative pathways for the sharing of outputs. In March 2011 the CGIAR, FAO, and GFAR (all Founding Partners of CIARD) prepared a global survey on 'Communicating Research Outputs' in order to understand better the motivations, attitudes and constraints of researchers in agriculture and related fields.

Methods

For the CIARD survey a questionnaire was made available online in three languages (English, French and Spanish)[2], using SurveyMonkey, and researchers alerted to its presence with the kind support of national and international partners/networks available to and familiar to the CGIAR, FAO and GFAR. The target audience covered the fields of agriculture, livestock, forestry, fisheries, food and nutrition and related biological, environmental, economic and social fields. By mid-September 2011, 1447 responses had been received, distributed across the three languages as follows: English - 538, French - 154, Spanish - 755.

---

1   **http://project-soap.eu/**
2   Questionnaire available online. English: **http://svy.mk/raL0HI**. French: **http://svy.mk/nlqubr**. Spanish: **http://svy.mk/nBlTwM**.

The results are split into two sections. Part 1 reports on questions which relate to geographical location, fields of research, organization type, sources of funding, and other 'organizational' matters. Part 2 reports on questions which relate to researcher behaviour, attitudes and motivations. The results for all three languages have been aggregated into one data set which is the main focus for this report. Where relevant, the analysis of the separate language data sets is referred to.

The analysis of questions considered in Part 2 used a technique called 'rating average' to measure the strength of the respondent group's scoring of a particular factor. In these questions, respondents rated a number of factors as being of 'High', 'Medium',' Low' (or 'Not at all') importance in the context of the question. The rating average for each factor was derived from a relative weighting, whereby High, Medium, etc are allocated a score which is multiplied by the number of scores for that weighting, and expressed in relation to the total number of scores for that factor. This is the rating average. In some cases the differences between rating averages within one question were not large enough to derive significant conclusions. Where they are large they are displayed. In most questions the bar chart presented shows the relationships between the high, medium and low responses to the question.

Results: Part 1 - 'Organizational' Information

Respondents' Fields of Work

Most respondents identified agriculture as their field of activity (64.3%), though there was a broad spread across the other categories. Within the different language groups some significant variations are apparent. The English language group responded similarly to the overall data, with 64.8% scoring agriculture. The Spanish language group showed less emphasis on agriculture (52.4%) but otherwise the responses fitted well with the aggregated data. The French language group showed a much stronger emphasis on agriculture (77.9%) but also related biological fields and related environmental fields (both at 35.1%) scored more highly than in the aggregated data. It is possible that these variations are related to the organization of research and teaching in the countries/regions of the respondents.
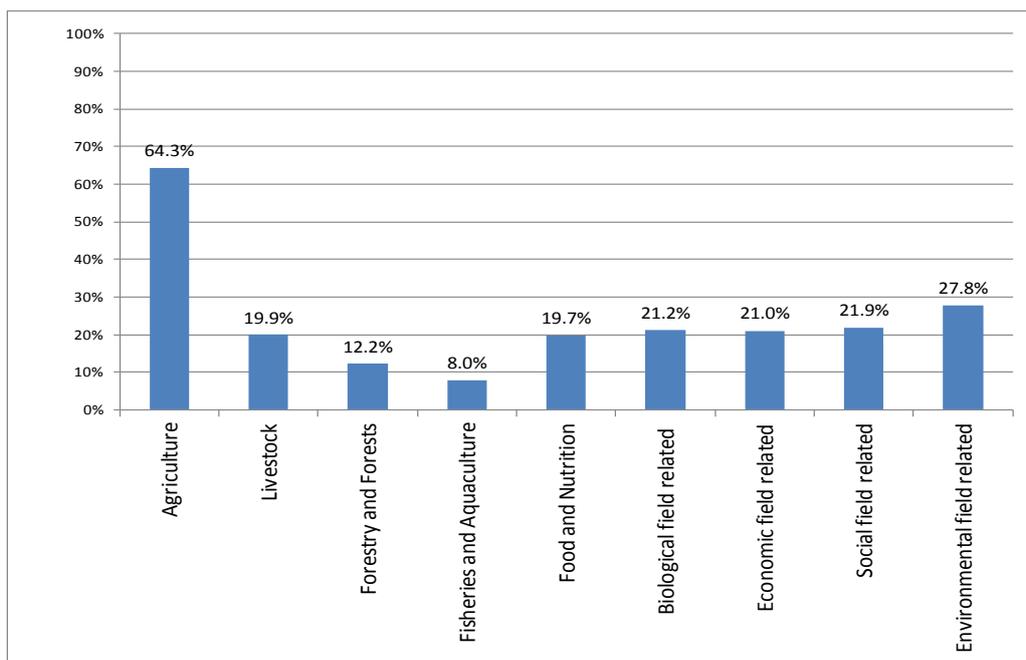

Figure 1. Field(s) of work of respondents.

Region where respondents were active

Respondents could select more than one region. The region in which respondents were most active was Latin America (53.5%). Africa (32.6%) and Asia (23.7) were well represented, and Europe and Northern America[3] were cited by few respondents.
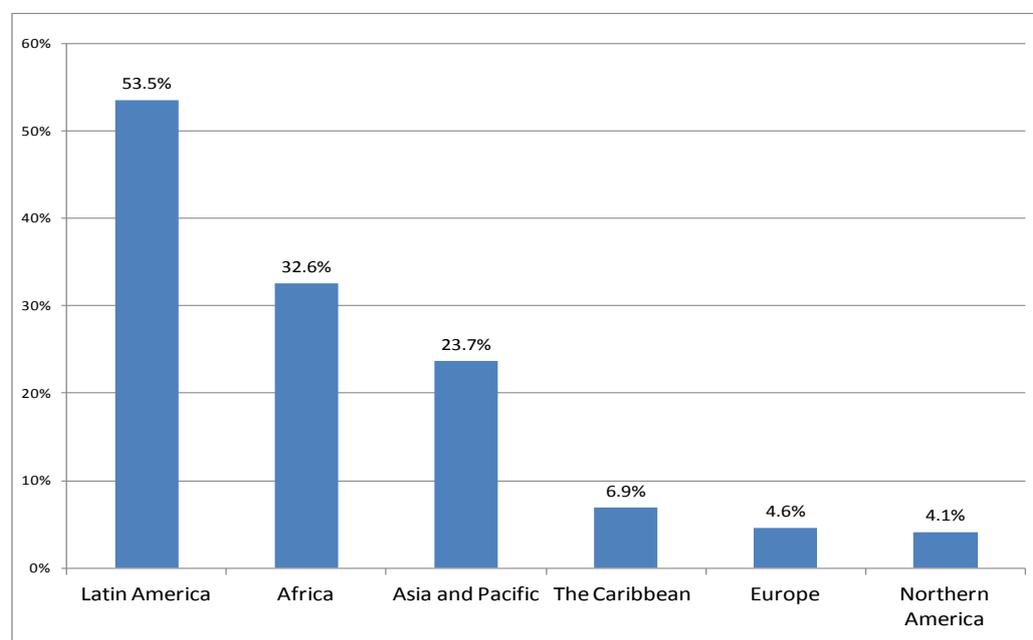

Figure 2. Region(s) where most respondents' work is carried out.

The data of the separate language groups indicate that the English language respondents were active in all regions, with strongest representations in East Africa (19.4%), South Asia (18.6%) and South East Asia (15.0%). Spanish language respondents were focused mainly on Latin America (90.8%) and the Caribbean (8.9%). French language respondents were widely spread with the strongest presence in West Africa (47.1%), Central Africa (22.9%) and Latin America (19.3%).

Respondents' gender

The aggregated data shows a strong predominance of males (73.9%) vs. females (26.1%), and these proportions were consistent across all language groups.

Respondents' organizational affiliations

National research institutions (NRIs) (37.5%) and universities/educational establishments (32.4%) were the main locations for respondents. Extension/advisory agencies represented a very small proportion (4.5%). However, there were some significant differences between the language groups. The scope of English language respondents is very similar to that seen in the aggregated data. The Spanish language data indicated a stronger representation of universities/educational establishments (42.9%), weaker representation of NRIs (29.2%), with extension/advisory agencies as a slightly stronger group at (7.4%). The French language data showed a strong bias toward NRIs (59.4%) with international/regional (non-CGIAR) research centres next at 17.2%. Universities were much less frequent (10.9%) and extension/advisory agencies were not represented at all in the French results.

---

3   United States of America, Canada, Greenland, Bermuda, Saint Pierre and Miquelon
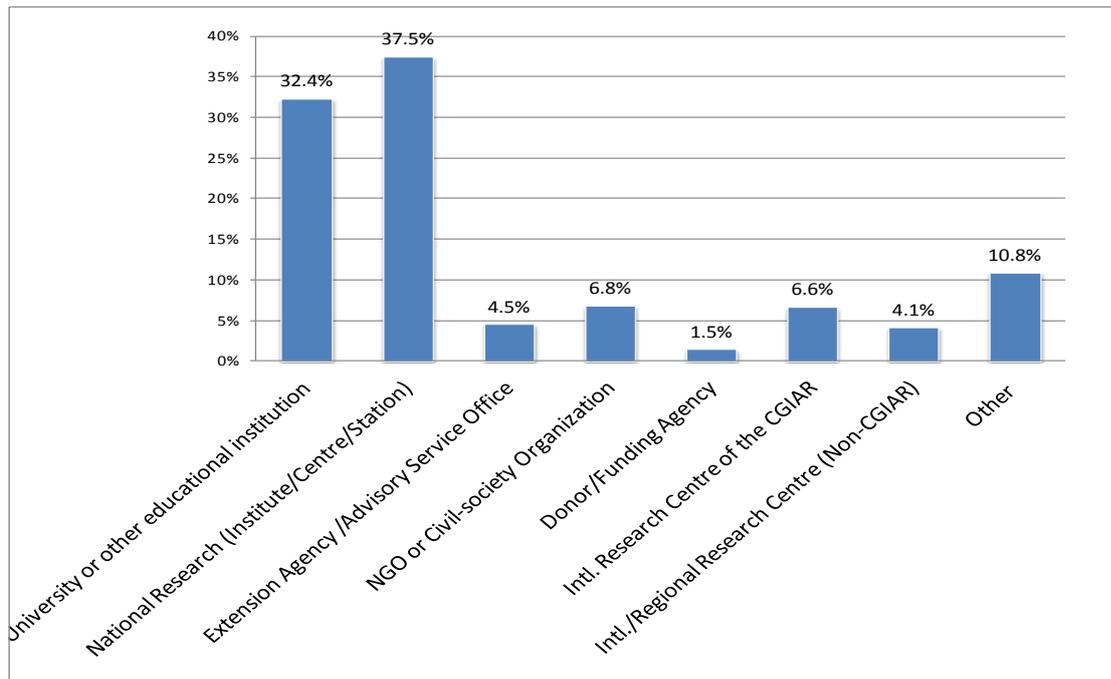
Figure 3. Frequencies of organization type.

Funding sources for activities

A significant proportion of respondents considered that funding from private or public sources is not very significant in developing/driving their research - 72.4% indicated that private/commercial sources are of low extent or not applicable, while the equivalent for public/not for profit funds was 45.7%. This result was perhaps surprising and it may indicate some lack of understanding concerning the various ways in which their research is funded. However, from the opposite perspective, the results showed that public/non-profit funds (54.3% for high and medium extent) are more important in driving research activities than the equivalent seen for private/commercial sources (27.6%).
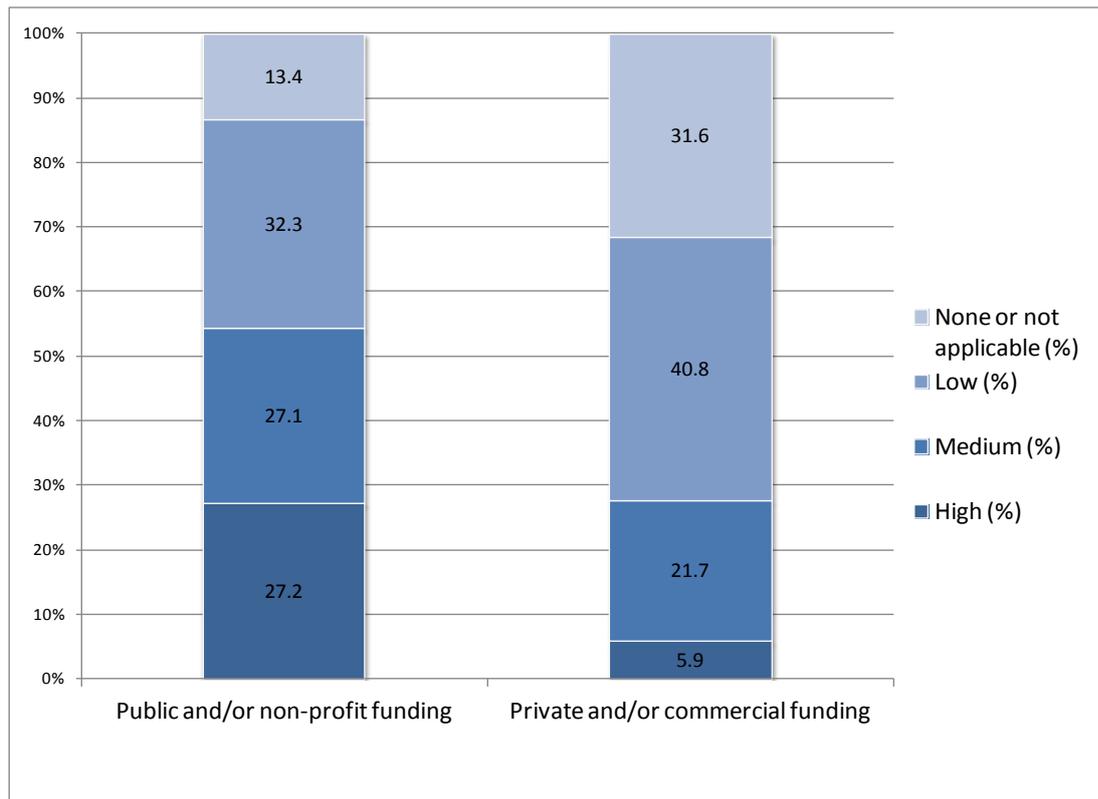
Figure 4. Relative importance of funding sourcing for respondents 'research.

Analysis of the separate language groups indicates that for the English and French groups the picture is similar to that shown above, though the rating average scores tend to give an even stronger emphasis to public funding. However the Spanish group shows less differentiation between the public and commercial scorings. This may indicate an overall greater significance for private funding in the Spanish group than in the other two.

Primary area/s of respondents' activity/ies

A large proportion of respondents indicated their involvement in research (79.7%), with education and training also popular (54.8%). Extension and advisory activities were also significant here at 31.6%.

The separate language groups showed some variations between them. The English group show a strong emphasis on research (82.3%) but also with levels of scoring in several other categories that are higher than the overall group. This result implies perhaps that these researchers are working across categories in the implementation of their work (e.g. research + extension), or see their role in this way. The Spanish group shows a pattern very similar to the aggregate, but with greater emphasis on education (63.7%) and extension (38.8%). The French group is most focused on research (92.5%) with a lesser emphasis on the other categories.
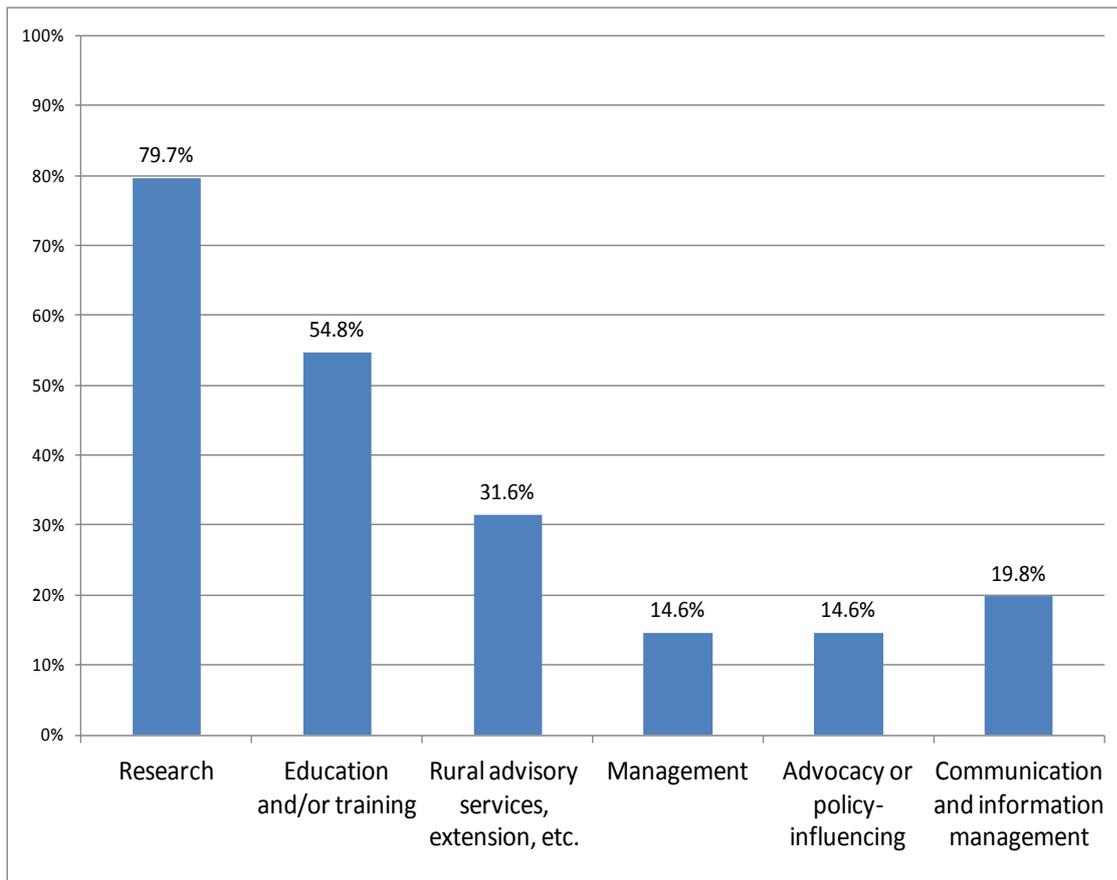
Figure 5. Primary activities of respondents.

Results: Part 2 - Researcher behaviour, attitudes and motivations

Importance of different target audiences/groups

Almost all the target categories had a predominantly 'high' rating, with 'medium' also heavily scored. Within this picture there are one or two issues to note. The target group 'NGOs and civil society groups' has a lower 'high' rating than the others, at only 40%, but its 'medium' rating is 39% which is higher than the others. The highest 'high' rating is national researchers (71%), followed by farmers and producers (63%) and academic groups and international researchers (both at 58%). Noteworthy results from the separate language groups are that 'farmers and producers' are rated higher than all others in the 'high' category by the Spanish language group. Also, in the French group 'international researchers' and 'national researchers' are scored far higher in the 'high' category than by the other target groups.
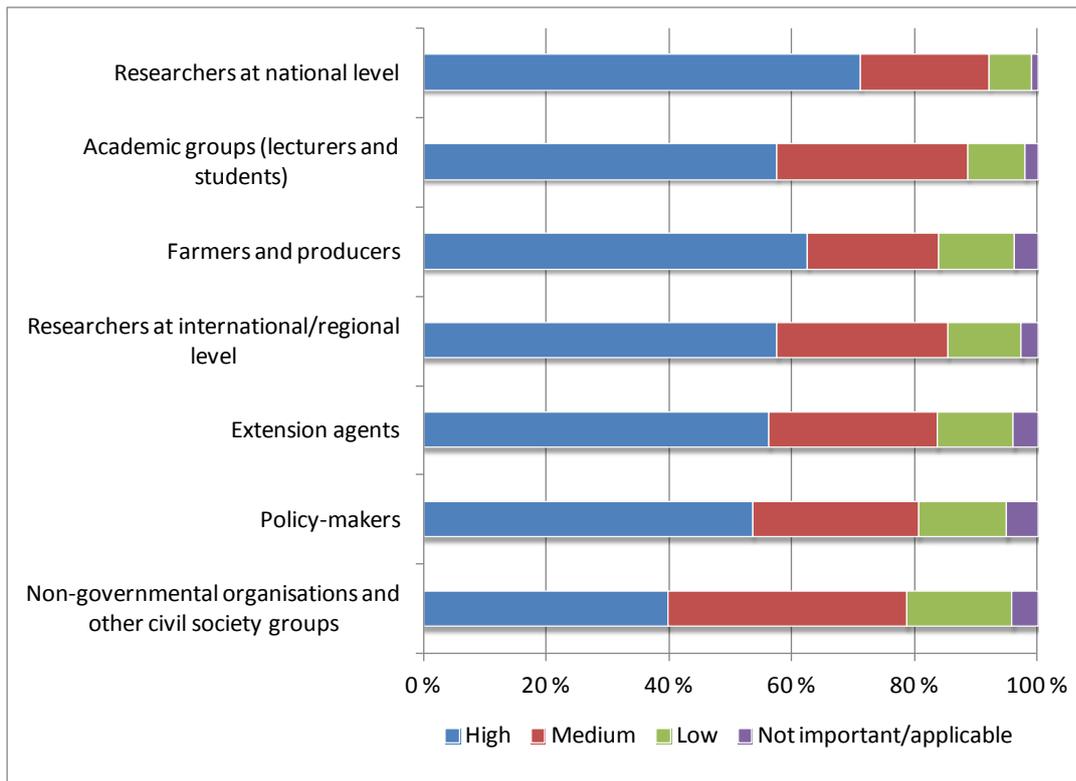
Figure 6. Relative importance of target groups for communicating research outputs.

Factors that encourage effective communication of research outputs

Respondents identified the most important factors which encouraged them to communicate their research outputs effectively were related to 'opportunities for career enhancement', 'institutional demands to report or communicate outputs', and institutional capabilities ('access to adequate IT infrastructure'), while they gave the lowest priority to direct monetary reward in relation to royalties and opportunities for personal development. The chart shows that most of the scoring was in 'high' and 'medium' categories, and low scores in 'not important', implying that these issues are important in the current thinking of the respondents. Rating averages did not show large variations between factors, except for 'Payment of a portion of royalties…' which had significantly lower 'High' and 'Medium' scores than other factors. The overall picture presented by the aggregated data is that issues relating to institutional capabilities (particularly in IT), institutional demands, and opportunities for career development, take precedence over direct monetary/reward issues and the protection of intellectual property.
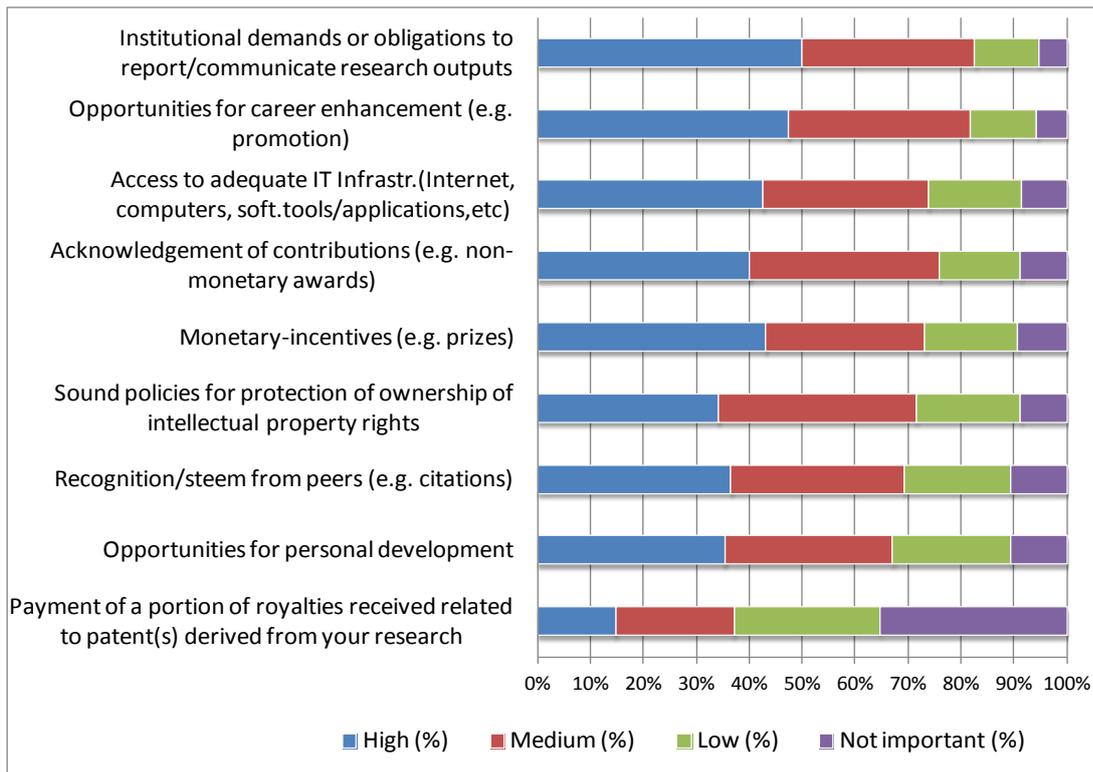
Figure 7. Relative importance of factors encouraging the effective communication of research outputs.

Benefits of communication of research outputs

Respondents identified the most important benefits gained by communicating research outputs as being 'contributing to science', 'reaching the target audience' and 'contributing to alleviating hunger and poverty'. The lowest importance was given to 'increased personal recognition within organization', 'promotion/salary increase', and 'opportunities for professional/personal development'. The chart below shows the emphasis on 'high' and 'medium' scoring, with very low numbers for 'not important'. These responses indicate that the driving forces for the respondents tend to be more related to altruistic issues of furthering science and making an impact rather than toward personal gain, whether in financial or personal status.
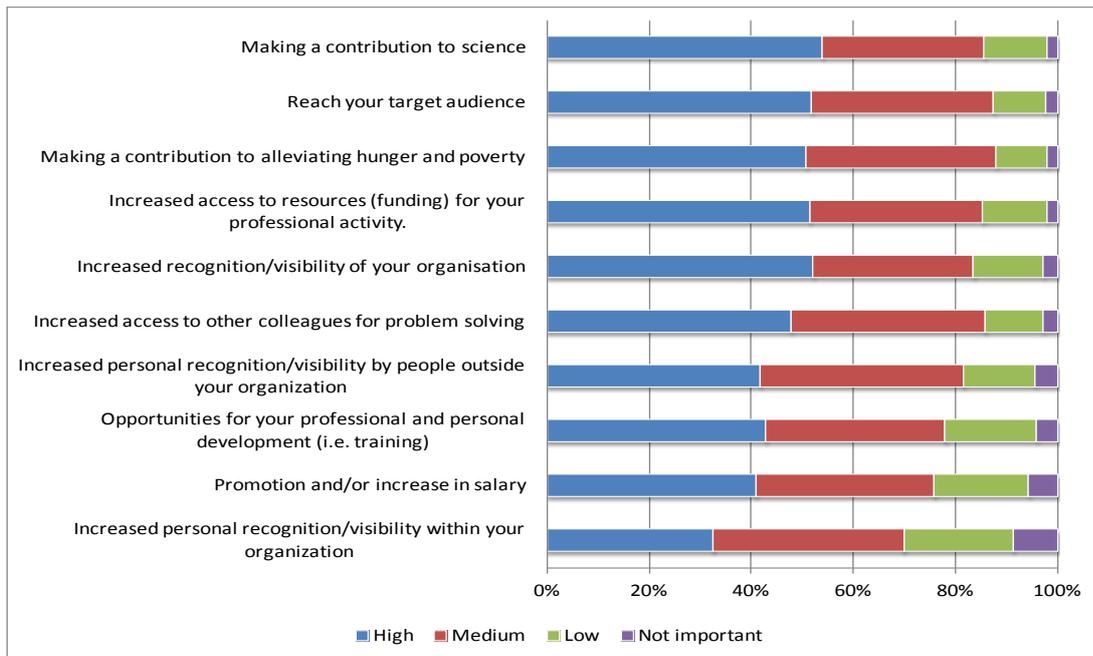
Figure 8. Relative importance of the benefits gained by communicating research outputs.

Barriers to communication of research outputs

The most significant barriers that prevent researchers/scientists from communicating research outputs were identified by respondents as 'lack of resources/time', 'lack of funding', and 'weak linkages between researcher and end user'. The least important barriers were found to be 'concerns about stealing and re-use of outputs etc', 'lack of skills/access', and 'poor IT infrastructure'.
There was no significant difference in responses between the language groups.

This suggests that the real situation for researchers is often a complex one without simple solutions. The implication also is that, although significant, these negative factors do not wholly undermine the efforts of researchers to communicate their outputs. Communication of research to target audiences is perceived as being of high importance and thus it appears that researchers will tend to focus on this no matter how high the barriers are.
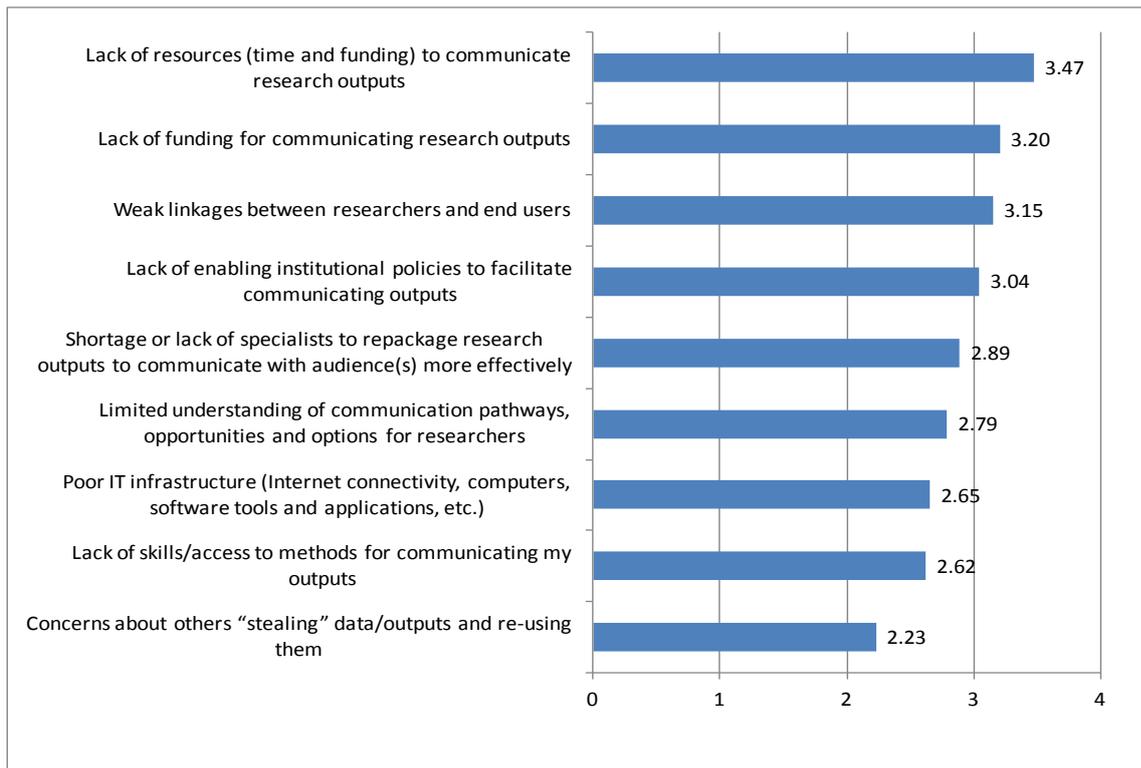
Figure 9. Relative importance of barriers faced by researchers/scientists communicating research outputs (Rating average).
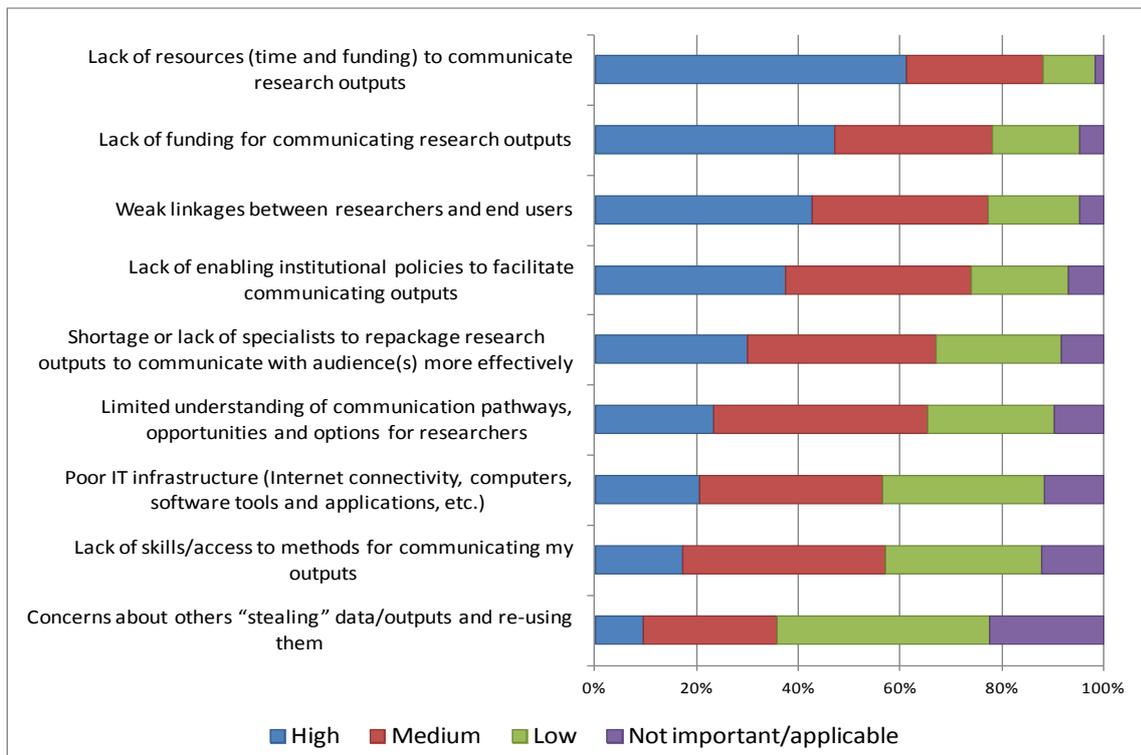

Figure 10. Relative importance of barriers preventing researchers/scientists communicating research outputs (Relative weighting of scores).

Importance of support mechanisms for effective communication

All types of training support scored predominantly high and medium, showing a clear demand. 'Training for web-based social media' and 'training for participatory research methods' come highest with 'writing and authoring skills' lowest. However, some differences are seen in the separate language groups - the most prominent one being that the French-speaking group rate training for writing and authoring skills the highest.
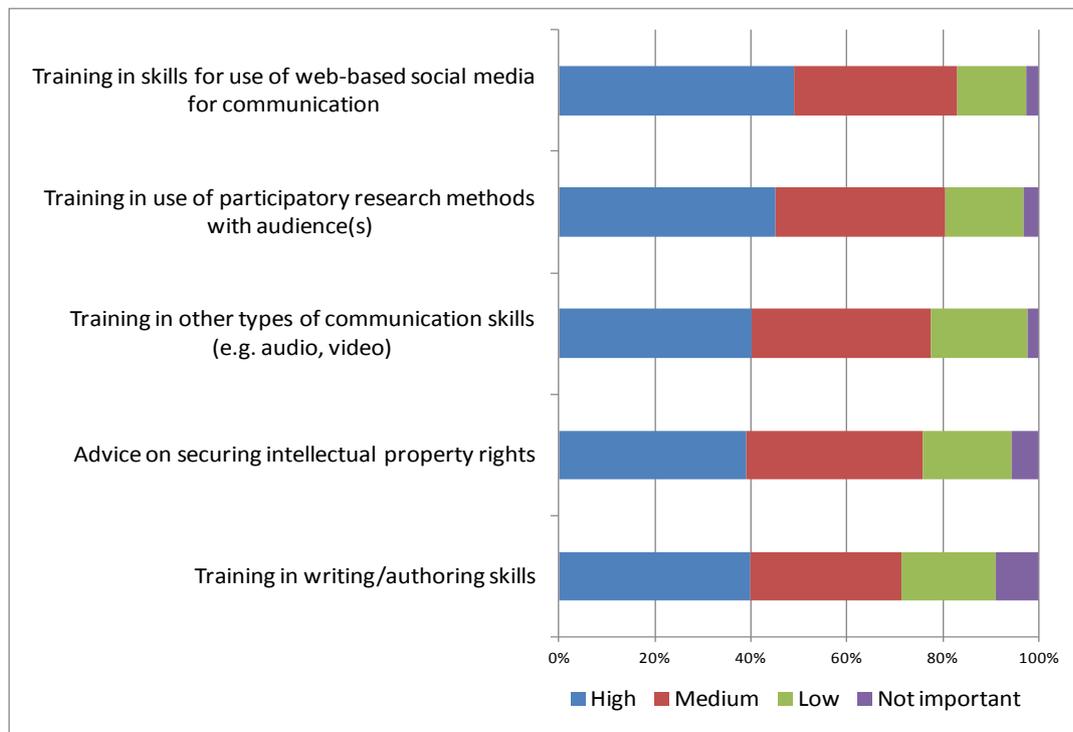

Figure 11. Relative importance of support mechanisms for effective communication of research outputs.

Principal channels for communication of research outputs

The responses showed a strong emphasis on communication using 'scholarly publishing' (75.5%) and at 'conferences and seminars' (74.0%), with 'training materials' also high (46.7%). Newer communication techniques have a much weaker presence, such as 'web-based social media' (18.3%), 'e-newsletters' (16.8%) and 'repository/websites' (28.9%). This indicates that the new methods of communicating research, which the internet is enabling, still take a lower priority with practising researchers.
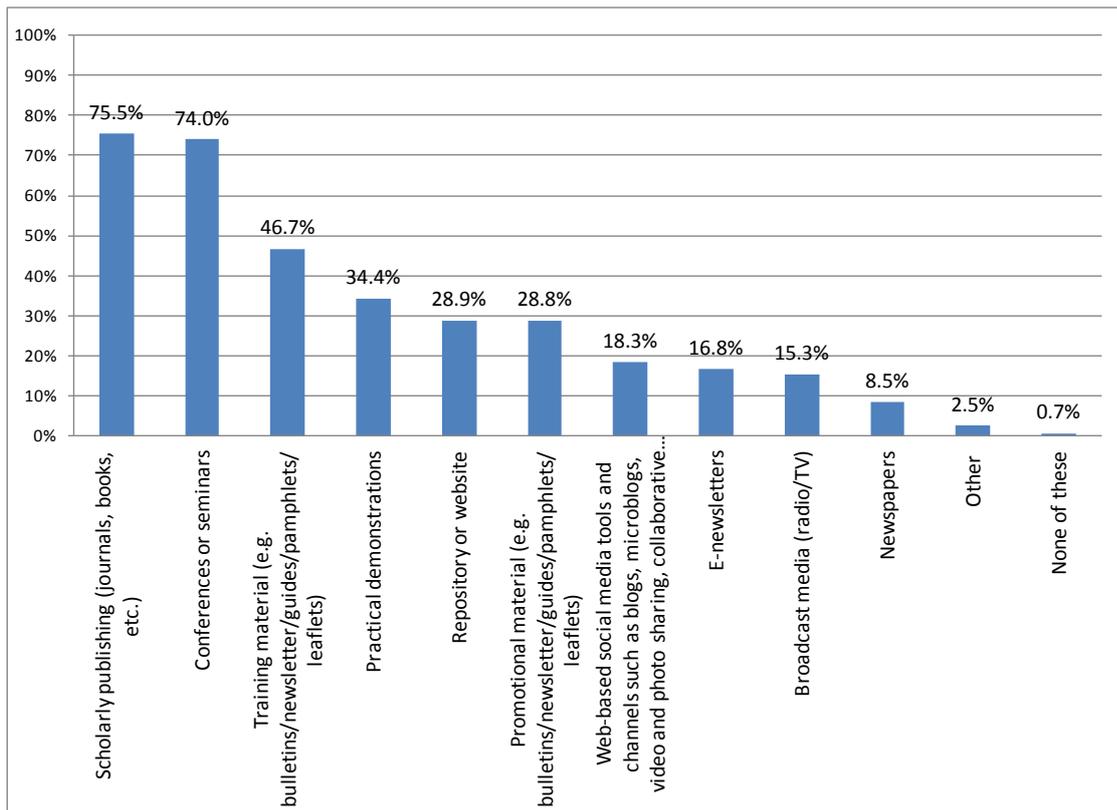
Figure 12. Relative importance of channels for communication of research outputs.

Interestingly, there were some significant differences between the results of the different language groups, which may point to some variation in national or regional approaches. Although the profile for the English group was somewhat similar to the overall analysis, both use of 'web-based social media' (25.5%) and of 'repository/websites' (34.3%) were higher than in the overall group. Also, the French-speaking group was very focused on traditional communication through 'scholarly publishing' (93.1%) and 'conferences and seminars' (86.3%) while the newer approaches were rated much lower.

Types of research communication outputs produced

In total there were 1031 responses to this question. The analysis divides into three areas.

1.   *Print/analogue vs. Digital outputs*
As shown in the chart below, print/analogue formats were identified more often by respondents as being used for the more traditional types of research output -journal articles, books, theses, informal articles etc. A variety of digital formats also were identified. So for the traditional research communication routes the traditional print formats still predominate. However, it was noticeable that even where print formats were still dominant there was also a significant scoring for digital outputs (20% to 35% and more), the implication being that digital formats are now penetrating substantially into all types of activity.
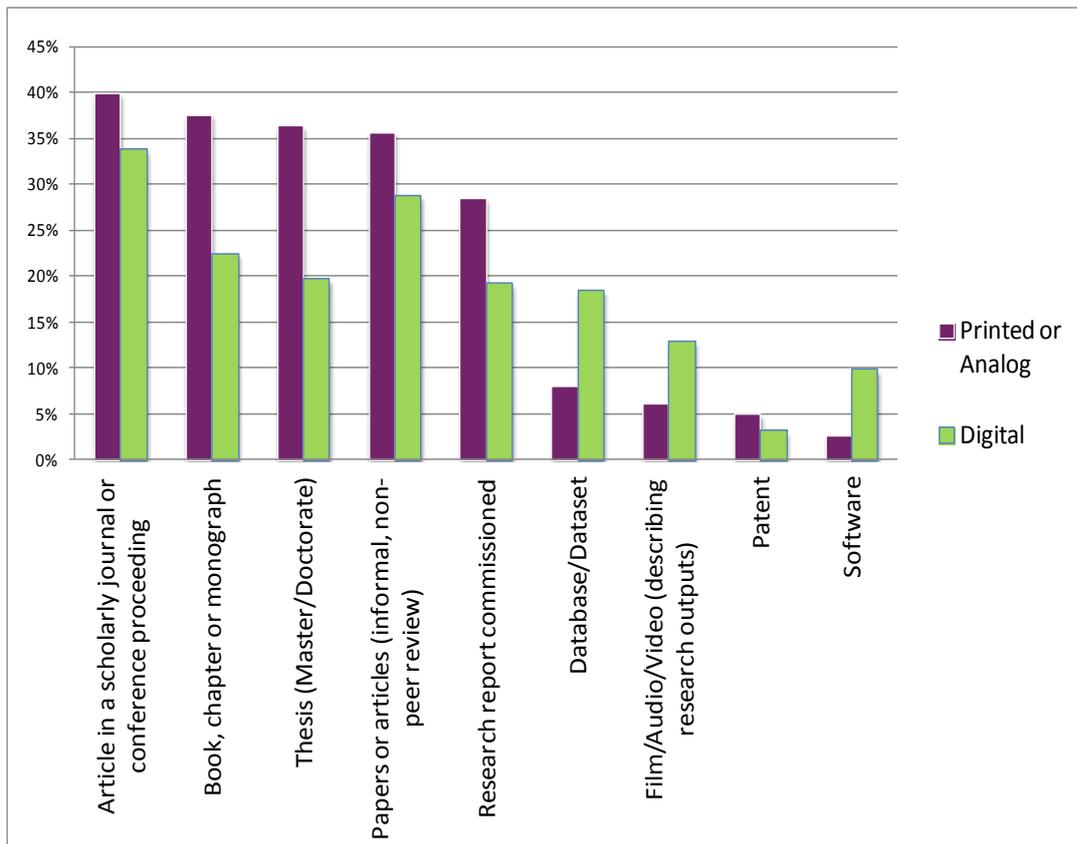
Figure 13. Relative importance of types of research outputs (printed vs. digital).

2.   *Free vs. Priced Access to Research Information*

Respondents showed a clear preference for 'Free' access to the outputs of their research, except for patents. However, the 'Priced' option was favoured more in the more popular formats of output such as book and journal publication, and also software.
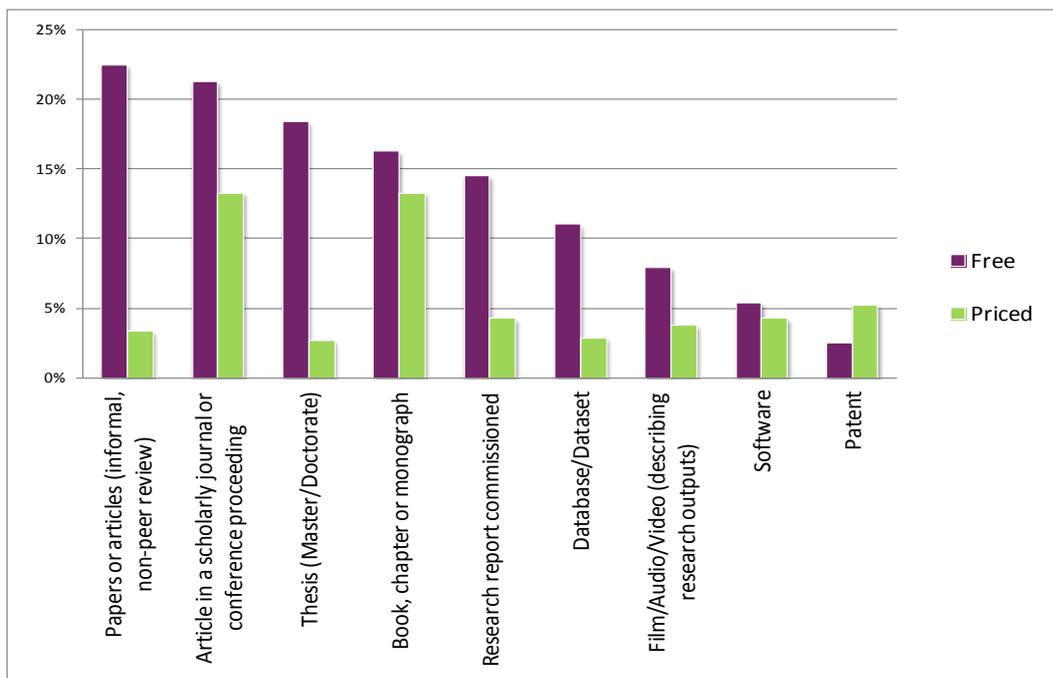

Figure 14. Relative importance of cost of research outputs (free vs. priced).

3. Open vs. restricted access

As in 2. above, respondents indicated their preference for open as opposed to restricted access, even for the traditional publication routes of books and journals.
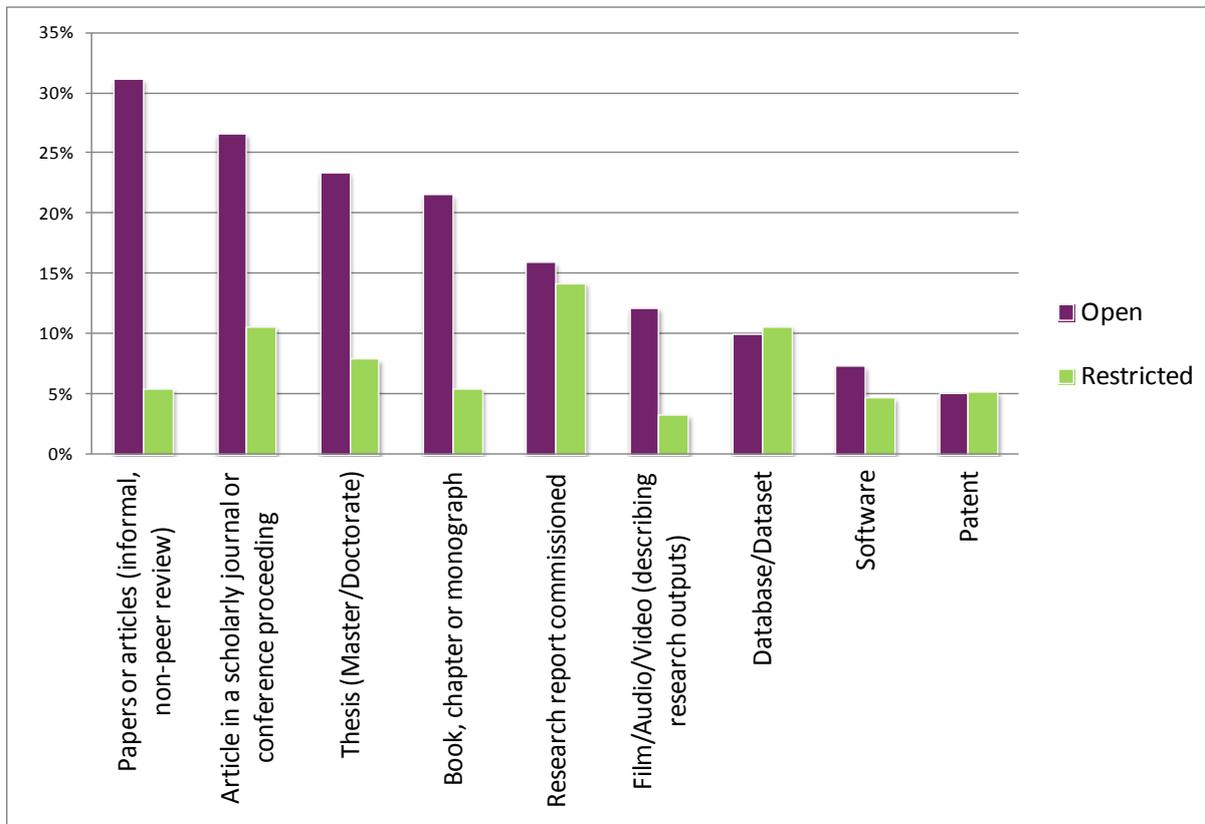

Figure 15. Relative importance of types of research outputs (open access vs. restricted access).

Analysis of the separate language groups showed that there were no significant differences between them for any of the above three parameters. It may be that for the responses to both 2. and 3. above the respondents were consciously communicating their research outputs in products and services and systems that make content freely available, or they may have reflected their confusion about who pays for what to be made available. Often a price is being paid somewhere in the communication chain which may not be clear to the researcher who has authored the content. There are also complexities concerning what we mean by cost/no cost and open/restricted. However, it is clear that large bodies of research outputs are being made openly accessible at no cost by these respondents.

Discussion and Conclusions

The researcher base that was surveyed was spread globally, though with a significant concentration in Latin America. It was predominantly male, was working in agriculture and closely related fields, and the majority were based either in NRIs or university/educational institutions. A significant proportion of the group was also working with extension and advisory services.

A significant body of respondents considered that funding from private or public sources is not very significant in developing/driving their research. Generally, public/non-profit funding is more significant for the research activities of the researchers and institutions than private/commercial funding.

Effective communication of research outputs was rated highly, with the most important tar-

gets being peers at NRIs, farmers and producers, and academic groups such as students and lecturers. The drivers for research communication are complex, though the most highly rated are institutional demands and commitments, and opportunities for career enhancement.

The most important benefits of communication gained by scientists tended to be altruistic, e.g. contributing to science and reaching important target audiences, rather than focused on personal gain. Many factors were perceived to be acting as barriers to communication, in particular the lack of resource/support, the lack of funding, and poor access to farmer groups as recipients. The researchers rated highly the need for support and training to increase effectiveness in communication, with the most highly scored being training in Web2.0 activities and in participatory research methods.

The respondents saw journals and conferences as the preeminent ways to communicate their research outputs, with activities in the Web 2.0 genre rating much lower. As authors, they are still using predominantly print-based formats for communication through traditional routes, such as books and journals, but digital formats have now penetrated into all types of activity to varying degrees. The results suggest that the respondents are communicating most of their outputs through openly accessible, no-cost routes.

The summary is based on the aggregated data from what is in overall terms only a modest sample size, taken predominantly from the Southern hemisphere. One principal axis of possible variation between the language of response showed no significant variation on almost all aspects, so it can be assumed that the weight of Spanish language responses is not biasing the overall results significantly. A more detailed analysis of responses using different parameters to distinguish within the sample, such as area of employment, would require a larger sample.

The Way Forward

The survey results bring many valuable insights into current perceptions of researchers into the communication of their outputs particularly in Latin America, Africa and Asia. These findings can be considered by senior managers in agricultural research systems as they review their organizational policies.

The analysis above shows that, although researchers are driven in their work by many different and interacting motivations, institutional/organizational factors are very important and have much influence over individuals' behaviour. Often, making a research output freely and openly available can be in the hands of the individual, and some will act in this way. However, for many others there are perceived barriers to this, such as the lack of required resources and of institutional policies to drive these activities. Institutional/organizational behaviour can be changed by the development of relevant strategic and policy frameworks. In many cases individual behaviour will not be changed unless there are policy requirements which influence the individual.

The CIARD initiative can learn from the survey and adjust its approach. CIARD aims to influence and provide support at both the level of the organization and of the individual. The initiative is a collective commitment to promote and sustain the openness of agricultural knowledge for all. CIARD aims to provide guidance and support to, and through this to change the behaviour of, both individuals and institutions. Through institutional change will come also enhanced individual change and, in the case of the CIARD initiative, increased and pervasive openness of research outputs. There is already much 'best practice' in institutions/organizations around the world, but a great deal more needs to be catalysed before the overall aims of CIARD are achieved.

Contact information

Philip Edge
Food and Agriculture Organization of the United Nations (FAO)
Oxford, United Kingdom
edgedr@gmail.com

Franz Martin
Food and Agriculture Organization of the United Nations (FAO)
Rome, Italy
franz.martin@fao.org

Stephen Rudgard
Food and Agriculture Organization of the United Nations (FAO)
Rome, Italy
stephen.rudgard@fao.org

Nadia Manning-Tomas
Consultative Group for International Agricultural Research (CGIAR)
London, United Kingdom
nadia.manning.thomas@gmail.com