

# Construction and housing information needs in the Third World: an international survey

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**Abstract.** This paper presents the methodology and findings of an international survey carried out in 1989 on the existing information needs and technical facilities of professionals in the field of construction and housing (448 responses from 92 different countries). The survey aimed at the determination of future information services, and five guidelines for future database development in the area were determined, each illustrated with respondents' quotations. The guidelines are: (1) there is a substantial demand for an information system which allows for information exchange between professionals in the area of construction and housing; (2) for this information system to be fully effective, it must be *client-oriented*; (3) for the system to be relevant, two approaches were suggested—the establishment of a regular horizontal information flow and the establishment of regional institutions acting as centres for information dissemination; (4) the issue of cost must be tackled since it was identified as one of the major constraints on the widespread use of electronic equipment; (5) the development of such an information system must be carried out in co-operation with existing efforts in the area of information on the building and construction industry.

## 1. Introduction

The objective of this paper is to bring together certain findings of the international survey which was initially directed at the specific field of construction and building materials relevant to the low-income housing sector. The survey itself was one output of a study carried out in 1989 at the University of Sheffield's Centre for Development Planning Studies under the sponsorship of the UK Overseas Development Administration on the

feasibility of creating a Third World database on housing, building and planning issues [1].

The purpose of the survey was (1) to try to characterise the types of information needs of those with interests in the field, (2) to determine the kinds of information management equipment which they possessed and (3) to determine the type of information service which they felt would be most beneficial to their work.

## 2. Method

A survey of database users and producers was envisaged at the outset of the feasibility study as the most adequate, albeit labour-intensive, method of actually determining both the capability of producers and the needs of users. Given the heterogeneous array of products which were thought to be available, information on the various types of databases as classified by East [2] to include bibliographic, factual, full-text and numerical databases, were to be collected. In particular, the user survey was seen as a way of, to paraphrase Bell's views [3, p. 120], breaking out of the common pattern in certain quarters of rarely consulting the ultimate users of information systems on the matter of system content and design. On the contrary, the survey was seen as the main tool "to explore the preferences and practices of individuals and groups in the specific information environment" [4, p. 285].

As a result, the need for a widely-distributed structured questionnaire on capabilities and needs was seen as essential. As it was fully recognised that both producers and users differ widely, ranging from international organisations to consultancies to development projects, government ministries, research institutions, universities and concerned individuals, it was felt that the most economic approach to compiling a list of addresses for potential respondents was by the use of the latest *Habitat Directory in the Field of Human Settlements* [5]. This Directory, compiled originally by the Information Centre for Regional

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Planning and Building Construction of the Fraunhofer Society for the United Nations Centre for Human Settlements, is comprised of three main subsections: United Nations and related bodies, international and regional organisations and national bodies arranged by country. Although the Directory was used in the knowledge that it had the most encompassing list of organisations concerned with the field of building and housing, addresses in countries not available in the Directory (e.g. Angola) were pursued through other sources to obtain as wide a distribution as possible.

The resulting questionnaire [6,7,8] was structured in three parts:

- (1) *characterisation of information needs* which included questions on subjects of interest, information needs at work, use of summaries, reference facilities and services used by the respondent to pursue information within the field as well as availability (or planned availability) of equipment;
- (2) *preferred ways of receiving information* which included questions on preferred media, price and availability of copies, as well as an open-ended question on the role of information technology in narrowing the gap between "rich" and "poor" countries; and
- (3) *identification* which included items such as the type of organisation.

Since English, Spanish and Portuguese are spoken by staff at the Centre involved with this survey, cover letters accompanying the questionnaire were in these three languages as appropriate.

In all, 1,782 questionnaires and letters were sent to potential respondents in 141 countries. Of these, 448 responses were received from 92 countries, representing a 25% response rate which was considered as satisfactory in view of the wide distribution of the questionnaire. The quantitative data were analysed using the Statistical Package for the Social Sciences, Version X. The qualitative information, given its open-ended nature, was grouped into categories to add detail to the statistical measures derived.

The respondents were from Europe (30.1%), Africa (17.6%), Asia (17.2%), South America (15.6%), USA and Canada (5.6%), Mexico and Central America (3.3%), Australia and New Zealand (3.3%), Caribbean Islands (2.9%), At-

lantic and Pacific Ocean Regions (2.2%) and Middle East (2.0%) and worked in government (28.1%), education (27.2%), national/regional research institutions (15.6%), consultancy groups (15.0%), international organisations (8.3%), finance institutions/professional associations etc. (2.9%) and library or information and document delivery only Unit (1.8%). 1.1% did not answer this item.

Before considering the results which were obtained in the survey, a word of caution must be offered to avoid over-zealous interpretation. It is suspected that the respondents to the survey were, in at least one sense, self-selecting. Those with no interest or expertise in information technology issues almost certainly decided not to return the questionnaire. Hence, the proportion of respondents may well have little meaning even though the characteristics of those who did respond is likely to be quite significant.

### 3. Information needs of database users

This section will present, question by question, the results obtained. (Text in italics refers to the actual questions.)

In order not only to characterise the information needs of respondents but also in a rather subtle way to determine their research priorities, Question 1 provided a list of possible subject areas which were thought to be of interest to them.

*Within the broad field of housing, building and physical planning in developing countries which of the following subjects are of interest to you?*

Subjects included such items as "Building Materials: Types and Characteristics", "Building and the Environment", "Local Building Materials" and "Popular Housing". Respondents were able to indicate interest in more than one of the areas. The most frequently cited interest was "Low Cost Building Materials" (70.8%) followed by "Popular Housing" (65.2%) whilst there appeared to be less interest in "International Cooperation in the Building Industry" (38.8%).

Interestingly, highlighting the possible difficulties involved with present international assistance priorities, the subject indicated most frequently in

Table 1  
In your work do you need (please tick as many alternatives as you find necessary)

	Responses	%
Articles (Journals)	392	87.15
Books	364	81.3
Regular list of bibliographical references	330	73.7
Dissertations	195	43.5
Other kinds of documents (please specify)	145	32.4
Drawings/Graphics	239	53.3
Photographs	230	51.3
Other types of information (please specify)	111	25.0

Europe and North America, "Building and the Environment" was ranked very near the bottom in less developed areas of the world, where low-cost housing subjects predominated.

The second question tried to determine the types of information felt to be of importance to the respondents. Following comments on technical publications and the building industry [9], a number of alternatives were presented which would give the respondents the opportunity to highlight features which, in their view, should constitute part of a future information system. The results are shown in Table 1.

*Other kinds of documents* included "Grey literature", "Trade literature", "Newsletters", "Government statistics", "proceedings", "case studies". *Other types of information* included "Newspapers, "Maps and City Plans", "Microfiche", "Audio-Visual materials", "Posters", "Cartoons".

Although this suggests that traditional source materials such as words on paper are the most important inputs to the work of the respondents (confirming the study's underlying assumption of the importance of a bibliographically-oriented database which might include summaries of such works) the importance of verbal sources is still significant.

Summaries of works were found to be of importance to the respondents as the responses to the following question show:

*Do you use summaries as substitutes for obtaining the full copies of documents? Do you use summaries as an aid to decide whether or not to obtain a document?*

Fully 92.9% of the respondents reported that summaries were used as an aid to decide whether or not to obtain a document and over half (54.2%) used summaries as a substitute for the original.

The questionnaire also sought to determine the source of suitable summaries.

*Do you at present use your own or have easy access to any of these services below? (Abstracting or indexing journals; Online services; Other services)*

The most popular were found to be "Abstracting or Indexing Journals" (used by 50.0% of respondents) followed at some distance by "Online Services" (22.1%). The use of online services is, not surprisingly, subject to significant geographical bias. Of the positive responses to this question, fully 63% were in the "developed world", while the remainder were largely from South America and Southeast Asia.

Asked whether *the sources listed in the previous question were satisfactory* only 35.9% of respondents were satisfied with what was available. A number of comments were made by the respondents to substantiate their responses. Although most were concerned with problems associated with lack of access and difficulties in document delivery, others were concerned with coverage. One respondent answered "I need access to very technical books and data instead of sophisticated methodology *not* applicable in developing countries" while another reported that the sources were of limited value because "the assumption that these are important to a housing study in a given developing country is not valid."

Satisfaction rates also varied by geographical area and by type of organisation. Respondents from developed countries were more likely to be satisfied with such services than those in the developing world (40 + % in North America, Europe, Australia/New Zealand vs 20% in Africa and South Asia). Among organisational types, the most satisfied were libraries (50%), international organisations (49%), educational institutions (35%), consultancies (34%) and government organisations (33%).

It is worth noting here that a number of respondents emphasised the importance of personal contacts at both national and international levels as sources of information. This agrees with

the findings of an earlier survey on information and the construction industry [10].

A central issue of the survey was an attempt to determine improved ways of making information on low-cost housing and construction techniques/materials available to users, a step that would hopefully reduce the waste of scarce research resources. Whereas the earlier discussion has provided some evidence as to perceived needs by the international housing and construction community, any improvement in the situation, particularly when reliance is expected to be increasingly on methods of electronic dissemination, is very much dependent upon the equipment available. This involves not only a determination of what hardware is currently available, but perhaps even more importantly, to determine concrete plans to increase hardware availability.

Hence, the question, "Which facilities and which equipment (a) do you have in your organisation (b) have already ordered / planned or (c) have not planned but would acquire if it proved to be important", the responses to which constitute Table 2.

Although all regions contained organisations which claimed possession of such equipment as microcomputers, CD-ROM facilities, telephones, modems, fax machines and conventional libraries, the survey revealed that the growth of information transmission and receiving equipment was still at a relatively primitive stage. Even such basic equipment as microcomputers (possessed by less than two-thirds of respondents) and telephones (possessed by less than 77%) are not universally available.

94.6% of respondents said they would like to

Table 2  
Facilities and equipment available

	Have %	Already ordered/ planned %	Not planned but would acquire if important %	No response %
Library <sup>a</sup>	360 (80.4)	19 (4.2)	39 (8.7)	30 (6.7)
Microcomputer IBM or IBM compatible <sup>b</sup>	308 (68.8)	24 (5.4)	47 (10.5)	69 (15.4)
Microcomputer other than IBM <sup>b</sup>	156 (34.8)	11 (2.5)	63 (14.1)	218 (48.7)
CD-ROM drive	36 (8.0)	15 (3.3)	107 (23.9)	290 (64.7)
Telephone	343 (76.6)	5 (1.1)	25 (5.6)	75 (16.7)
Access via computer to an international telecommunications network	109 (24.3)	25 (5.6)	143 (31.9)	171 (38.2)
Modem	121 (27.0)	30 (6.7)	133 (29.7)	164 (36.6)
Facsimile	195 (43.5)	37 (8.3)	98 (21.9)	118 (26.3)
Other <sup>b</sup>	50 (11.2)	10 (2.2)	51 (11.4)	337 (75.2)

<sup>a</sup> In the case of the "Library" alternative, the respondents were asked to specify the field.

<sup>b</sup> In the cases of both "microcomputers" and "other" alternatives, the respondents were asked to please specify make, model and operating system.

receive information on housing and construction relevant to developing countries. However, their responses to the following question about how they would like to receive this information suggested mainly traditional methods.

*Would you be interested in receiving information on housing, building and physical planning in developing countries? If "yes", in which form(s)?*

Fully 90.2% of respondents ticked the option "Printed Copy", compared to 51.6% who could cope with floppy disks, 18.3% online delivery, 11.4% hard disks, 9.6% magnetic tape and 7.6% CD-ROM disks. An array of other alternative modes received lesser mention, including video cassettes, facsimile, slides and the creation of national computerised housing information systems.

The geographical distribution of responses to this question is of interest. Although care must be taken in interpreting the results, since respondents were able to select more than one preferred mode of receiving information, regional variations can be noted. Respondents from Africa and the Caribbean were most enthusiastic about receiving information in printed form whilst more of those from Asia suggested floppy and hard disks and CD-ROMs than the world average, and fewer of them suggested printed copy, magnetic tapes and online services.

The widespread use of CD-ROM technology in the two years since the survey must be acknowledged. If, as during the survey, few organisations had facilities for CD-ROM (8% had CD-ROM drives 3.3% had already ordered or planned them and 23.9% would be willing to acquire one if it proved to be important), the picture now should be rather different with more and more organisations using CD-ROM technology. Being more cost effective than online search systems for information that needs to be updated quarterly or less often, not depending on telecommunication systems and being capable of containing enormous amounts of information, CD-ROMs have become a familiar feature in working environments. As a respondent from New Zealand summarised it: "CD-ROM has enormous potential, they can contain huge amounts of information, they are cheap to produce, easily updated, and good retrieval software can make them interesting to use..."

#### 4. Guidelines for future database development

At this stage, the information needs within the area of Third World construction, building supplies and housing have been identified, as has the technical capability of its users. Already, efforts have been made by certain bodies to meet the needs which exist. As noted in the survey, (*Question 5: Do you have your own database?*) and later on in a follow-up, 67 organisations in an array of countries were identified who maintain databases in the field. Although a small proportion of these databases are available on a commercial basis, such as IBSEDEX from the Building Services Research and Information Association—UK, BRIX from the UK Building Research Station and ICONDA from the IRB Verlag Information Centre for Regional Planning and Building Construction of the Fraunhofer Society (which in turn obtains more input from organisations in other countries and regions), the overwhelming majority of the databases identified are small-scale efforts which have been specifically created to meet in-house needs. These include efforts to create a file of names and addresses of construction component suppliers in Turkey, to keep track of development sites in Trinidad and to monitor water development projects in the Philippines. Although a number of producers of this latter category of databases may be willing to make such information available to other users on a personal basis, the coverage is such that they are probably of only limited value to the international community.

The survey provided some insight into the desired characteristics of construction and housing databases. This was gained through a very general question in the survey on the potential role of information technology with respect to housing and construction in the developing world. (*Question 11: Considering the area of housing, building and physical planning, what role do you think information technology has in narrowing the existing information gap between "rich" and "poor" countries?*)

Answers which mentioned similar points were grouped and out of those, five basic guidelines for future database development were identified:

(1) Without doubt, there is substantial demand for such information systems and exchange in the field of building materials and housing. Of

those surveyed, 79% responded to the open-ended question, emphasising particularly that it would be accomplishing that role if it could be used for a real exchange of experiences between countries as a means of avoiding failures and highlighting successful approaches to housing problems. As a respondent from Peru noted, "The role of information technology is [to act as an] information facilitator offering and disseminating low cost technology as well as safe and reliable information on materials". This is particularly true, as a respondent from Mozambique noted, since "technology will become more accessible in the sense of 'user-friendly', 'application specific' and at 'lower costs'."

(2) To be fully effective, information on building materials and housing must be relatively specific and "client-oriented". In one sense this is merely another way of saying that the information made available must be applicable to specific local conditions if it is to be of any use. This issue was also raised by the UN Economic Commission for Africa (1983) when it emphasised "the unsuitability of textbooks and training materials that are, in the main, imported from industrialised countries" [11, p. 68]. A respondent from the United Kingdom neatly summed up the position: "Rich countries have volumes of data most of which are repetitive, unoriginal and a waste of time". From Malawi came the comment that information must "be tailored to the requirements of the potential users" while a respondent from Mauritius insisted that "information poured into 'poor' countries should be suitable to [their] needs".

(3) At least two ways were identified in the survey as means of ensuring relevance. The first of these would be through the establishment of a regular horizontal information flow. Such flows would contrast with current approaches which seem to be highly centralised, with information being sold from the centre, normally located in the developed world, to the periphery, the developing world. As a respondent from Trinidad and Tobago noted, "...downward information is often irrelevant and undesirable, there should be more horizontal communication between 'poor' and 'poor' for alternate and appropriate technologies". A number of information users replied in a similar vein, arguing against the general idea of "poor" countries being solely providers of "raw

data" to sophisticated systems in the developed world who then recycle, regurgitate and resell the information back to the developing world at inflated prices.

The second approach to assure relevance was the quite frequently noted suggestion for the establishment of regional information dissemination institutions. For example, a questionnaire from Thailand included the comment that "getting electronic information to 'poor' countries is difficult and making use of the information is an additional challenge... perhaps regional institutions are the first place to strengthen along with selected national focal points". One from Indonesia proposed that "information technology could be used to place relevant information at a few key places in each developing country and that these centres could then disseminate it within the identified region". Along similar lines, a respondent from Brazil made the interesting suggestion that "an international institution, such as the World Bank, or even a multinational corporation, such as IBM, might finance 'seed' equipment to start one information-centre in each developing country".

(4) The issue of cost was frequently identified as a major constraint to the use of electronic equipment as a means of transferring information. Cost was primarily seen as an impediment in securing hardware rather than information itself. This may well be a reflection of the low degree of use of relatively expensive online approaches as well as the unavailability of information for CD-ROM drives noted earlier.

Ironically, the availability and cost of software was rarely mentioned as an impediment to the exploitation of information technology in the developing world. Almost certainly this is due to the efforts made by various international organisations to develop and make available user-friendly software at nominal prices. Without doubt, the leader in this field is the United Nations Educational, Scientific and Cultural Organisation's contribution with respect to CDS/ISIS.

CDS/ISIS is produced, supplied and supported by the Library Archives and Documentation Services Division of UNESCO. It is specifically designed as a bibliographic storage and retrieval package. Not only does it have the reputation of being user-friendly, but perhaps most importantly, it is available free of charge to nonprofit

organisations in developing countries. As a result, among the 67 organisations who have themselves produced databases, as identified in the survey and included in the directory which has been compiled, 21 use CDS/ISIS, a number which surpasses the use of its nearest commercial rival, dBaseIII+. A Directory has been compiled of these organizations [12].

The clear conclusion is that if producers of information on Third World construction and housing are genuinely interested in creating a service which is accessible in the developing world, the software which should be used is CDS/ISIS.

Even then, however, given the relative shortage of electronic equipment which is available, the argument for hard copy, that is, information in printed form, will remain in the foreseeable future. Although in part this is a result of the cost of equipment, it, in fact, goes even further. As an earlier review of the information technology situation in the developing world concluded [13, p. 239], "access to computerised databases requires a degree of technical sophistication in telephony which is not present in many UN nations". Machine-based systems are unlikely to replace the "browse-through-a-book" approach or the importance of personal contacts as a means of obtaining important information.

(5) Finally, development of information systems and specialised databases must be carried out in co-operation with existing information providers to the building industry. The potential user must not be seen as the target of a number of different and competing information systems. Perhaps surprisingly, substantiation of this conclusion was most frequently provided by research workers in the developed world. As a French respondent noted, "one more attempt to set up a database? How many more next year? Please consider working together with existing ones". A Canadian reinforced the point, "Try to make this an 'institutionally compatible' exercise by including the organisations that already seek to provide information". One can only hope that those observations were made in a genuine desire to make information on construction and housing available to those who need it in an efficient and cost-effective manner rather than as a defence of the present arrangement of information provision largely from more developed countries in Western Europe and North America.

## 5. Conclusions

A number of conclusions would seem to follow from the survey and the analysis of its results:

- An identified need does exist for the creation and low-cost dissemination of relevant information on construction, building materials and housing approaches in the developing world.
- The issue of relevance cannot be overemphasised, particularly when the limited resources available for this activity within the developing world are considered.
- One way of assuring relevance is through facilitating the dissemination of research findings contained in the so-called "grey literature" in databases which contain at least summaries of such studies. The related issue of document delivery, i.e. making the original studies available to interested users, is also important.
- Relevance would be reinforced by the promotion of horizontal flows of information, within countries, within geographical regions and even between regions with similar problems and at similar development levels. One way of accomplishing this might be through the creation of regional information centres which would probably be concerned not only with collecting and distributing information on construction, building materials and housing within their area, but also on a wide array of other information on development within the region.
- The potential for electronic dissemination of such information is high, but not yet fully realised. As a short-term solution, and possibly one which might extend into the medium term future as well, low cost printed material on these subjects will continue to prove to be essential to information dissemination. Although the day of instantaneous, low-cost electronic dissemination of such information may be approaching, it does not appear to have arrived yet. However, a combination of distribution methods could be appropriate—CD-ROM, print on paper and even floppy disc but the financial implications of this would be considerable.

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## Appendix 1

List of countries (92) from where questionnaires were returned

Argentina	Korea
Australia	Kuwait
Austria	Lesotho
Bangladesh	Malawi
Barbados	Malaysia
Belgium	Mauritania
Benin	Mauritius
Bolivia	Mexico
Botswana	Mozambique
Brazil	Namibia
Burkina Faso	Nepal
Cameroon	Netherlands
Canada	New Zealand
Czechoslovakia	Nigeria
Chile	Norway
China	Pakistan
Colombia	Panama
Costa Rica	Paraguay
Cuba	Peru
Denmark	Philippines
Dominica	Portugal
Dominican Republic	Rwanda
Ecuador	Senegal
El Salvador	Seychelles
Ethiopia	Sierra Leone
Fiji	Singapore
France	Spain
Gambia	Sri Lanka
Germany	Sudan
Ghana	Swaziland
Greece	Sweden
Guatemala	Switzerland
Guyana	Tanzania
Haiti	Thailand
Honduras	Togo
Hong Kong	Tonga
India	Trinidad and Tobago
Indonesia	Tunisia
Iraq	Turkey
Israel	United Kingdom
Italy	United States
Ivory Coast	Venezuela
Jamaica	Yugoslavia
Japan	Zaire
Jordan	Zambia
Kenya	Zimbabwe