

Sustainability of Scientific Journals in the Developing World With Special Reference to Bangladesh

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Abstract

The study explores sustainability of scientific journal publication in Bangladesh. Forty-three journal editors were interviewed, and 66 current journals were physically examined for production quality, regularity of publication, and availability at concerned libraries. Findings revealed that 68% of the journals were published late, 30% had inconsistencies in typesetting, and 14% were indexed. Most journals were found either excellent or of good quality in terms of printing (85%), binding (77%), paper (92%), and graphic reproduction (76%). Most journals were not avail-

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able in major libraries under study. Of the 43 editors, 28 (35%) reported a cost-recovery of 1-45% from subscriptions, advertisements, and sales. About 74.4% of the editors did not consider their journals at risk. Although 86% of the editors were confident that their journals would be sustained in the long run, 37.3% could not give any convincing logic in support of their statement. Major problems include lack of skilled staff, finance, quality articles and institutional support, and lengthy peer review process. Only one journal editor was found to be a full-time editor having training in editing and publication. One-half (51%) of the editors reported have training in editing, while four had publication training. Most editors (79%) were interested in acquiring training in editing and publication. Institutional support and backup, enthusiasm and zeal of editors, unmet need for standard local journals, constant flow of funds and articles, and skilled manpower are instrumental for sustainability of science journals in Bangladesh.

Well-edited and professionally produced journals are a vital instrument for the advancement of knowledge. The scientific journals, first published in 1665, maintained an annual growth around 7% (Lock, 1991). Stephen Lock observed that recently this growth rate had slowed slightly but there was no sign of any substantial diminution in the growth of new journals. New disciplines emerge every 10 years and need to have their own specialty journals, where (initially at least) the authorship is the same as the readership (de Solla, 1981). Publishers still find it economical to introduce new journals with a circulation of only 300-400.

The necessity of journal publication in developing countries can not be ignored. Most internationally reputed journals are not easily available to the scientific community in countries like Bangladesh. Many researchers from developing countries find it difficult to publish their work in such journals for various reasons, such as language problems, or a low level of writing and presentation skills. Haskell and Menyonga (1995) re-

ported a high rejection rate of papers submitted to international journals by agricultural research scientists from developing countries. Youdeowei and Mukanyange (1995) found that African agricultural researchers were facing problems in publishing their research results due to weakness in the production and management of local scientific journals. Major components of this weakness were a shortage of trained science editors and of professionalism in science editing and publishing. Such gaps are filled by journals published in developing countries. These are easily accessible, and low-priced (Ahmed, 1995).

Stephen Lock (1991) argued that "The journals (published in the Third World) are mostly of indifferent physical quality, contain poor science, come out late (many listed do not appear at all), and are less read than foreign journals where most of the country's top scientists publish their best work. Articles tend to be accepted without peer review and published in order of receipt" (p. 4).

Samiran Nundy (1991) also endorsed Stephen Lock's observation. According to Nundy, "Medical journals in developing countries are, with very few exceptions, unattractive. They contain poor science and are published late. In addition, they are rarely indexed in indexing services or referred to by researchers in either the developing or the developed world. Consequently, they constitute less than 5% of the world's cited scientific literature although developing countries have more than two-thirds of the world's total population" (p. 74). A. R. Tindimubona (1995) observed that a poor economy, high illiteracy rates, and a low capacity in science and technology result in poor science communication. Eugene Garfield (1983) pointed out that India ranked third in the world in the number of researchers and eighth in the number of articles its researchers authored in the international journals (one-half of the total Third World output). While assessing the quality of all Indian medical journals ($n=113$), Nundy (1991) found that only four journals came out on time in 1985 and the others were usually 1-12 months late. Indian and foreign experts assessed their quality and felt that less than 20% were of international standard. The cumulated *Index Medicus* included 22, *Current Contents* three, and *Excerpta Medica* 26.

Eugene Garfield's (1983) study showed that 35% of all the articles by developing country authors were published in developing country journals. He also found that developing-

country articles had the greatest impact when they were published in The Netherlands, USA, and UK. It is equally important for the readers in the other part of the world to know how science is disseminated in developing countries, and their problems and prospects.

Marcia Angell's (1991) view is that a journal can not survive long if researchers do not submit their papers to it for publication. Authors' decisions concerning where to submit their research papers largely depend on the quality and prestige of the journal, prompt decision about the acceptance of papers, and how the editor treats the authors. A recent study (Ahmed, 1999) conducted in Bangladesh shows that nearly 46% of the scientific journals produced in Bangladesh were published regularly and only 11% were indexed. Most of these journals suffer from limited circulation and remain as grey (difficult to find) literature. Thus, the question of sustainability of the developing-country journals emerges, which compels us to initiate a stocktaking of the current situation of journals published in Bangladesh. This study looks at sustainability issues of journal publication in Bangladesh.

The word 'sustainability' is increasingly becoming popular in the developing countries and among the international funding agencies working in the developing countries. Sustainability has many definitions. Its dictionary meaning refers to something capable of being sustained in the long run. Sustainability depends on the degree of self-reliance. Catherine Lovel (1992) defined sustainability as the ability to continue without or with reduced dependence on outside support.

This study aimed to examine the sustainability of scientific journals. In other words, it aimed to examine the potential for journals to survive in the long run, taking into consideration quality (legibility, consistency, peer review and editorial process, and physical aspects), timely publication, ability to recover the publication cost, and other financial aspects. When a journal is financially viable, has enough subscriptions or advertisement income, has enough flow of articles, is published on time, and is available in concerned libraries, it is considered sustainable. The editors' views and the physical verification of the journals led to such a conclusion.

Methodology

All the English-language science journals published in Bangladesh were planned to be included in the study, but a

complete list of currently published journals was not available from any sources. Subsequently a list of 100 science journals was prepared for the study. The English-language journals were selected because most local journals are published in English. Structured, pre-coded questionnaires were mailed to the editors of all these journals. Of them, 43 journal editors responded from Dhaka, Gazipur, Mymensingh, Rangpur, and Rajshahi districts. Data were collected through face-to-face interview of 39 editors, and four questionnaires were received by mail. In some cases, the editors completed the questionnaires themselves at their convenience. The attempt was made to gather in-depth information on editorial aspects; peer review and the publishing process; reasons for publishing; regularity of publication and flow of quality articles (writing (readability) and logical presentation; research itself); circulation, subscription and readership; staffing and training need; major problems; and other financial aspects of the journal.

Eight major academic and research libraries of Dhaka city and another agricultural research library in Gazipur (a nearby town) were visited to physically examine the currently available science journals published in Bangladesh (Table 1). These libraries were purposively selected with an assumption that all the published journals would be available, since these libraries cover all the academic and research disciplines. Data were collected on the physical aspects of the journal (such as production quality and editorial consistency) and on the availability of the latest issues in the concerned libraries of similar disciplines. Regularity of publication and indexing information were cross-checked.

Krzyzanowski, Krieger, and De M Duarte (1995) evaluated the Brazilian current scientific periodicals applying the similar methodology that considered quality of publication, type of publisher, comprehension, indexing, tradition, regularity, and relative importance.

Of the 93 journals available in these libraries, 66 currently published journals were included that had a cover date between January 1996 and August 1998. The subjects included biomedical, agriculture, pure and applied science, economics, social development, political science, public administration, communication, engineering, statistics, and training.

The regularity of the publications was determined from the cover date of the latest issue available in the library. Only those journals were considered regular which did not have a

Table 1 Libraries Visited

Name of the library	Location		No. of journals found (%)
	Dhaka	Gazipur	
Bangladesh Agricultural Research Institute (BARI) Library		✓	21 (31.8)
Bangladesh Institute for Research on Diabetes, Endocrinology, and Metabolic Disorders (BIRDEM) Library	✓		14 (21.2)
National Health Library and Documentation Centre	✓		7 (10.6)
International Centre for Diarrhoeal Disease Research, Bangladesh (ICDDR,B) Library	✓		6 (9.1)
Bangladesh Agricultural Research Council (BARC) Library	✓		5 (7.6)
Dhaka University Library	✓		5 (7.6)
Bangladesh Institute for Development Studies (BIDS) Library	✓		3 (4.5)
Bangladesh Central Public Library	✓		3 (4.5)
BRAC (a non-governmental development organization) Library	✓		2 (3.0)
Total	8	1	66 (100)

backlog of more than one issue. It was assumed that the current issue had been published but had not yet reached the library (i.e., the copy might be in transit).

Findings

Outcome of In-depth Interview with Journal Editors

Of the 43 journal editors interviewed, 20 (46.5%) were editors of bio-medical journals, followed by social science (25.6%), agricultural science (13.95%) and other (13.95%) journals (Table 2). Journals in the 'other' category include pure science (three), statistics (two), and business studies (one). Among these journals, 32 (74.4%) were half-yearly and five (11.6%) were quarterly (Table 3). About 63% of all these journals were published by institutions, while associations or societies published 35% (Table 4). Most of these journal editors (76.7%) were found highly qualified (post-graduates and doctorates) in their main profession. Journal editing was treated as a secondary job by almost all of them (97.7%). Only one editor reported to be a full-time editor had training in editing and publication. One-half (51%) of the editors reported having training in editing, while four (9.3%) had training in publication. Most journal editors (79%) wanted to have training in editing and publication of science journals.

Table 2 Distribution of Journals According to Discipline	
Discipline	No. of journals (%)
Bio-medical sciences	20 (46.51)
Social sciences	11 (25.59)
Agricultural sciences	6 (13.95)
Others	6 (13.95)
Total	43 (100)

Table 3 Distribution of Journals According to Frequency of Publication	
Frequency of publications	No. of journals (%)
Half-yearly	32 (74.4)
Quarterly	5 (11.6)
3 per year	3 (7)
Yearly	3 (7)
Total	43 (100)

Table 4 Distribution of Journal Publishers	
Type of publishers	No. of journals (%)
Institutional	27 (62.8)
Association/Society	15 (34.9)
Others	1 (2.3)
Total	43 (100)

Reasons for Publishing Scientific Journals

All the journal editors were asked as to why they publish their journals. The most cited (67.4%) reason was to facilitate local researchers to publish their research findings. The second most cited (55.8%) reason was to disseminate research findings of the publishing institution and other similar national institutions. The third most cited (48.8%) reason was to disseminate research findings of one's own institution (Table 5).

Table 5 Reasons for Publishing Scientific Journals as Viewed by Journal Editors (n=43)	
Reasons	No. of responses* (%)
To facilitate local researchers to publish their research findings	29 (67.44)
To disseminate research findings of ours and other similar national institutions	24 (55.81)
To disseminate our institutional research findings	21 (48.83)
For institutional prestige	4 (9.3)
Others	1 (2.32)
* Multiple responses considered.	

Readership

Seventy-two percent of the editors thought their journals had adequate readership within the country, while 14% considered their journals having poor readership (Table 6). This assessment was possibly an assumption, as no such readership survey was known to have been conducted or reported elsewhere for any scientific journal published in Bangladesh.

Table 6 Readership of the journal	
Extent of readership	No. of journals (%)
Adequate within the country	31 (72.1)
Poor	6 (14.0)
Good	3 (7.0)
Don't know	2 (4.7)
No response	1 (2.3)
Total	43 (100)

Major Problems

Of the 43 editors, 30 (70%) cited various problems regarding their journals, and others did not respond to this question. Lack of skilled editors and publication specialists was considered to be the most vital problem (58%), followed by financial constraints (35%), and lengthy peer review process (23.2%) (Table 7). The other major problems as stated by the editors include lack of quality articles (16.3%), time constraints of the editors (16.3%), lack of assistance in editing (11.6%), and lack of coordination and networking (11.6%).

Table 7 Major Problems of the Journal According to Editors (n=43)	
Major problems	No. of responses (%)
Lack of skilled manpower (editors; publication specialists)	25 (58.14)
Financial constraints	15 (34.88)
Lengthy peer review process	10 (23.26)
Lack of quality articles	7 (16.28)
Time constraints of the editor	7 (16.28)
Lack of assistance in editing	5 (11.63)
Lack of coordination and networking	5 (11.63)
Lack of editorial training	4 (9.3)
Lengthy printing process	3 (6.98)
Language and presentation problem with articles received	2 (4.65)
Lack of institutional support	1 (2.33)
Irregularity in publication	1 (2.33)

Funding, Cost-recovery, and Sustainability

The study findings revealed that 19 (44.2%) journals had enough funds, while 16 (37.2%) did not have enough funds (Table 8). About 35% of the journals had a cost-recovery ranging from 1-15% from sales, subscriptions, and advertisements, while nearly 26% recovered cost from subscriptions only. Another 23% and 14% had cost-recovery in the range of 16-30% respectively from sales, subscriptions, and advertisements, and from subscriptions only (Table 9). Only one journal reported having full recovery from sales, subscriptions, and advertisements.

Table 8 *Response of Journal Editors on Fund Position of Journals*

Fund position	No. of journals (%)
Enough funding	19 (44.2)
Not enough funding	16 (37.2)
Sometimes get funding	6 (14.0)
Don't know	1 (2.3)
No response	1 (2.3)
Total	43 (100)

Table 9 *Cost-recovery of Journals According to the Editors*

Percentage of recovery	From sales, subscriptions, and advertisements No. of journals (%)	From subscriptions only No. of journals (%)
Nil	-	1 (2.3)
Very small amount	1 (2.3)	1 (2.3)
1-15%	15 (34.8)	11 (25.6)
16-30%	10 (23.2)	6 (14.0)
31-45%	3 (7.0)	-
Fully	1 (2.3)	-
Could not determine	3 (7.0)	7 (16.3)
No provision	1 (2.3)	3 (7.0)
No response	9 (21.0)	14 (32.6)
Total	43 (100)	43 (100)

More than 74% of the editors considered their journals sustainable at present. Although 86% of the editors were confident that their journals would survive in the long run, 37.3% did not respond as to how they would make their journals sustainable (Tables 10 and 11). Institutional support, enthusiasm of the editors, continued need for standard journals, enough flow of funding and articles, skilled manpower (skilled editors and publication specialists), and more care from the institution/society/editorial board were cited as the means to make journals sustainable in the long run.

Table 10 Sustainability of Journals as Viewed by Editors		
Responses of editors	<u>Sustainable at present</u> No. of journals (%)	<u>Sustainable in the long run</u> No. of journals (%)
Will sustain	32 (74.4)	37 (86.0)
Will not sustain	8 (18.6)	4 (9.3)
May not sustain	1 (2.3)	-
Don't know	-	1 (2.3)
No response	2 (4.7)	1 (2.3)
Total	43 (100)	43 (100)

Table 11 Means to Make the Journals Sustainable in the Long Run (n=43)	
Responses of editors	No. of responses* (%)
Institutional support	10 (23.26)
Enthusiasm and zeal of editors	6 (14)
Need of standard journals	3 (7) /
Enough funding, flow of articles, and skilled manpower	4 (9.3)
More care of the institution/ society/editorial board members	3 (7)
No response	13 (30.2)
* Multiple responses considered.	

Outcome of the Physical Verification of Journals in the Libraries

Availability

Sixty-six English-language journals were available in nine major libraries in Dhaka city and nearby Gazipur district town. The highest number (21) of current journals was found on display in the library of the Bangladesh Agricultural Research Institute (BARI), followed by the BIRDEM library (14) (Table 1). Of the 20 scientific journals published by the Dhaka University in the English language, five current journals were found available on display in the Dhaka University Library. Of the 20 bio-medical sciences journals included in the study, the current issues of only seven journals were available in the National Health Library and Documentation Centre, which was supposed to have all the bio-medical journals. Bangladesh Central Public Library had only three current journals on display.

Regularity in Publication

About 63% of the editors reported that their journals were published irregularly (Table 12), while our physical verification in the libraries revealed that 68% of the journals had a backlog in publication. Lack of funding, as reported by the editors, was the major cause of irregularity in publication (44%), followed by lengthy peer review process (22.2%) and lack of skilled workforce (18.5%) (Table 13). Here the workforce means editors, publication specialists, and proofreaders.

Table 12 <i>Regularity of Journal Publication According to Editors</i>	
Regularity of publication	No. of journals (%)
Published regularly	16 (37.2)
Published irregularly	27 (62.8)
Total	43 (100)

Table 13 Causes for Irregularity in Publication	
Causes	No. of journals (%)
Lack of fund	12 (44.0)
Lengthy review process	6 (22.2)
Lack of skilled workforce	5 (18.5)
Delay in proofreading and printing	1 (3.7)
No response	3 (11.1)
Total	27 (100)

Production

While reviewing the current journals in the libraries, we found that most journals were of either excellent or good quality in terms of printing (85%), binding (77%), paper (92%), and graphic reproduction (76%) (Table 14). On the other hand, 30% of the journals had inconsistencies in typesetting, design and layout, and setting of tables and charts. Only 14% were indexed. About 73% of the journals had abstracts with papers, and 27% had key words. Although 85% of the journals published authors' addresses, only 20% published complete postal address to help readers communicate with authors.

Table 14 Distribution of Journals According to Production Quality (n=66)			
Quality indicators	Excellent	Good	Poor
Printing	30 (45.5)	26 (39.4)	10 (15.1)
Binding	30 (45.5)	21 (31.8)	15 (22.7)
Paper	39 (59.1)	22 (33.3)	5 (7.6)
Graphic reproduction	25 (37.9)	25 (37.9)	16 (24.2)
Numbers in parentheses indicate percentage.			

Discussion

It appears from the findings of this study that most science journals published in Bangladesh do not have full-time professional editors. Journal editing has been carried out as an additional, secondary task. Only one editor was found to be a full-time editor having professional training in editing. Most

editors felt that they need training, but they were not sure from where they might acquire such training. These findings are similar to the situations prevailing elsewhere. Garrow, Butterfield, Marshall, and Williamson (1997) from the *European Journal of Clinical Nutrition* reported that clinical journals (98% located in the USA and Europe) were usually edited by practicing clinicians who were self-taught, part-time editors (95%) but were willing to accept further training. Autonomous National University of Mexico (UNAM) has included a medical writing course as part of the Diploma for Clinical and Epidemiological Research. There is also a serious intention of including medical writing as an elective subject in the curriculum of the School of Medicine of the UNAM (Avendano-Inestrillas, 1995). Shortage of trained, science editors and of professionalism in science editing and publishing were also highlighted as a major weakness in Africa and Latin America (Youdeowei & Mukanyange, 1995; Motta, 1995). However, there was no evident association between formal editorial training and the status of the journal.

Although most editors were very hopeful about the sustainability of their journals, not a single journal was found that earned profit. Cost-recovery was less than 45% in most cases, which raises the question of how they survive. Institutional support is the prime source for survival of almost all the journals. Academic and research institutions and professional societies sponsored almost all the journals (98%). A similar trend (79.6%) was observed in India where most journals (90/113) were sponsored by professional societies and academic bodies (Nundy, 1991). If any budgetary crisis arises in the publishing institutions, there will be no alternative but to cease publication. For example, recently, an indexed journal published in Bangladesh was proposed to be discontinued due to budgetary constraints of the publishing institution.

Lack of quality articles also appeared to be a major problem. To ensure enough inflow of quality articles, the journals should be published regularly with peer-reviewed articles, should be widely disseminated among the target audience, and must be made available at least in relevant libraries of similar disciplines. The journals also need to be indexed and widely publicized. Obviously, the production quality must be of international standard. A vicious cycle of three dilemmas that had been encountered by new scientific journals in small

countries was reported from Bahrain. These are: (a) lack of credit of locally published materials; (b) low quality articles due to lack of international recognition; and (c) financial constraints (Mohammad, 1995).

Comparing the current issues with the back issues (5-10 years old), we observed that the production quality (physical aspects) of local journals has improved significantly. This could be due to mass availability of desktop facilities in the country and developments in the printing sector.

Journal editors reported the readership of their publications as adequate within the country, although all the regularly published journals were not available in the relevant libraries. Surprisingly, even the academic libraries did not keep all the journals relevant to their disciplines. Some academic librarians reported that the senior faculties took away the journal copies just after the libraries received them, and they were never returned. If this practice continues, the journals will never be available in academic libraries. The librarians and the borrowers need to look into the matter.

Limited circulation, irregularity in publication, lack of access to an international audience, and nonavailability of journals in relevant libraries were the common problems observed. Lack of adequate finance, quality articles, and skilled manpower; and time constraints of the part-time editors were reported to be major problems, which are similar to the findings in other developing countries.

Very few locally published journals are comparable to international journals in terms of their quality. A common complaint in the international forum is that journals published from the developing world are not indexed/cited in the mainstream information services. Another charge is that news from the developing countries is under-reported in the international press (Garfield, 1983). In a review of Indian science using citation data, Garfield found that a wide range of subjects was covered but the quality of papers produced was poor. The impact of the articles was very low. Articles in Indian journals were rarely cited by foreigners, and 90% of the references in Indian articles were to foreign publications. One-half of the references were to articles more than 10 years old (Nundy, 1991). In the current study, only 14% of the journals were found to be indexed. Padron and Costales suggested that the

improvement of the peer-review process should be a strategic break-point of the scientific journals of developing countries in their quest for credibility and international acceptance (Padron & Gostales, 1997).

Though cost-recovery from sales, subscriptions, and advertisements was less than one-half, most editors claimed that their journals would be sustained. The major factor responsible for this is guaranteed institutional financing and continued support. Institutions publish journals for various reasons, and in some cases, cost-recovery, subscription, distribution, etc. are not the determining factors for continued publication of journals. Many journals are published late, have poor subscriptions, and are not widely disseminated. In such situations, no vigorous efforts were visible that were taken by the local publishers to improve the quality of journals and their dissemination.

Nundy (1991) suggested some ways in which the Western editors of established journals can help their colleagues in developing countries. These are: (a) offering continuous background support including helping with refereeing, checking references, suggesting potential authors and providing feedback on the manuscript; (b) providing training fellowships to editors from developing countries to work in the offices of established journals; and (c) giving 'how to' books on editing, old issues of Western journals, and outmoded technology to the developing-country editors.

Due to time and fund constraints, all the academic, research and public libraries of the country could not be visited to examine the availability of journals. On the other hand, if all the journal editors of the country would have been responded or could be interviewed face-to-face, the study results would be nationally representative. However, in the current study, 66 of 93 available journals (irrespective of regularity) in nine major libraries of the country were examined, and 43 journal editors responded from five districts. Thus, the results could safely be generalized for the whole country. Further in-depth study could be undertaken to explore some specific issues not addressed.

Conclusion and Recommendations

The findings of this study suggest that the journals published in Bangladesh have many problems and are not published

profitably. This is a subsidized sector, which does not always serve the purpose of wider dissemination. Many journals are published as the official organ of different societies, associations, or institutions. However, the extent of readership of these journals is subject to assessment. This kind of journal will sustain (continue to be published) as long as institutional support continues. These journals may be published late, and may not be available in relevant libraries and to potential readers. The sustainability of other journals is at stake both from financial and qualitative points of view, as long as they need to depend on enough flow of quality articles and subscriptions, skilled editors, and vigorous marketing efforts. Additionally, journals published in developing countries are facing an imbalanced competition with the journals published in developed countries. This is a reality that could possibly never be eliminated. Still, journal publication from developing countries should be continued to disseminate the findings of research and thoughts of the developing-country researchers. While doing so, skilled editors and publication specialists should try to improve the quality of their journals, disseminate widely, and earn revenues by overcoming the problems encountered.

To make the developing-country journals economically viable, the following suggestions/recommendations are worth consideration:

1. Professionally skilled and trained manpower must be engaged in editing, publication, and management of scientific journals. But they are not easily available. To develop a skilled and effective workforce, provision for training in journal editing and publication should be made.
2. Efforts should be made to raise funds for journal/publication by increasing the number of subscriptions, publishing advertisements, selling reprints, and obtaining funds from patrons and donors.
3. The peer-review process needs to be shortened but not at the cost of quality. The reviewers' list needs to be regularly updated including local and foreign subject matter specialists.
4. There is a need to provide more editorial assistance to journal editors who are mostly part-timers. Adequate

incentives should be given to skilled editorial assistants to get the best of their services.

5. In order to attract quality articles, the journals need to be published regularly, circulated widely, and indexed.

Key Words

Scientific Journals, Sustainability of Science Journals, Bangladesh, Science Communication, Publication of Journals, Journalology.

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