Dissemination pathways for cocoa research results in Ghana: The potential role of the radio

F. BAAH
Cocoa Research Institute of Ghana, P. O. Box 8, Tafo-Akim, Ghana

ABSTRACT

Studies have shown that farmers do not get requisite technological information they need to aid them in their decision-making processes. Using focus group discussions, questionnaire survey, and in-depth interviews, the study elicited information on socio-economic features, information sources and constraints from farmers in East Akim and New Juaben districts in the Eastern Region. Over 85 per cent of farmers had not met an extension officer in a year, but 63 per cent owned a radio and rated it highly. They preferred it to other possible communication channels. It is concluded that the radio could complement extension efforts in providing farmers' information needs. The implications of these and other findings are discussed.

Original scientific paper. Received 20 Jan 06; revised 10 Jul 07.

RÉSUMÉ

BAAH, F.: *Les canaux de propagation pour les résultats de recherche en cacao au Ghana: Le rôle possible de la radio.* La production de cacao continue à jouer un rôle important dans l'économie du Ghana, Il a contribué 4.3% au produit intérieur brut d' agriculture en 2004. Les rendements ont atteint la moyenne de 250 kg ha^{-1} qui est considéré faible quand il est comparé à 400 kg ha^{-1} en Côte d'Ivoire et Malaysia respectivement. Les études ont montré que les agriculteurs ne reçoivent pas l'information technologique requise qu'ils exigent pour les aider dans leur processus de prise de décision. En appliquant les discussions avec les membres du groupe-témoin, l'enquête par questionnaire et l'entretien en profondeur, l'étude a tiré d'information sur les traits socio-économiques, les sources d'information et les contraintes d'agriculteurs des districts de East Akim et de New Juaben dans Eastern Region. Plus de 85% d'agriculteurs n'ont jamais rencontré un vulgarisateur dans une année, mais 63% possèdent une radio et ils en ont une haute opinion. Ils préfèrent la radio aux autres canaux de communication. La conclusion est tirée que la radio pourrait être le complément de l'effort de vulgarisation pour la fourniture d'information exigée par les agriculteurs. Les implications de ce et d'autres résultats sont discutées.

Introduction

Cocoa continues to play a dominant role in the Ghanaian economy, contributing 4.3 per cent to agricultural gross domestic product (GDP) in 2004 (ISSER, 2005). Production has averaged 370,000 metric tones in the last 5 years, though the country has the potential to produce more. Constraints to higher productivity include low producer prices, high costs of inputs, inadequate extension support, and poor infrastructural facilities (GoG, 1995).

Information and knowledge are regarded as essential for farmers to respond successfully to the opportunities and challenges of the physical, social and policy environments in which they operate (McQuail, 1983). It has been said that empowering the poor is about providing them with information (World Bank, 2004), and the demand for agricultural information is stronger than ever (LEISA, 2002). Knowledge gaps and

information problems are key constraints to the efficient functioning of markets and equitable growth and development (Garforth, Khatiwada & Campbell, 2003). They also influence the adoption of innovations. Boahene (1995), for example, found that the adoption of hybrid cocoa in Ghana is influenced by lack of information concerning the existence and availability of the hybrid cocoa. Available communication strategies being used in farming communities to promote farmer learning include interpersonal exchanges, group processes (such as farmer field schools), mass media (largely the radio), mixed-media campaigns and, in more 'sophisticated' environments, Internet delivery from community telecentres (Coldevin, 2003).

The mass media, including radio, newspapers, television, video/film, audiocassettes and theatre/drama, hold much appeal and have played and continue to play increasingly important role in extension and social development work. Media practitioners generally perceive their role as information collection, selection, processing and dissemination to educate, inform, entertain and mobilize audiences. Audiences regard the media as a source of information about relevant events and conditions in their immediate and other surroundings (McQuail, 1983).

Extension workers have used the mass media to provide general and current information on agriculture, nutrition, health and rural development to rural households. Information sources which rural households can access to assist them in their decision-making processes are also provided by the media. Some media are very restrictive in their use. For instance, whereas many rural households cannot afford television sets, the few who could afford may not be connected to the national electricity grid and cannot afford batteries on sustained basis. The inability of many farmers to read newspapers restricts their use as information medium. Local language newspapers are rarely available. Even if they could read, the price of newspapers puts them beyond the reach of the rural poor. Extension through the mass media will only be effective if farmers have access to them (Garforth, 1994).

The radio remains the most important medium for communicating with the rural populations of developing countries (Odame & Kassam, 2002). Not all farmers have equal access to all mass media, but many have access to radio at home. This is very true of most Ghanaian cocoa farmers who regard the radio as a useful companion. In a review of the costs and benefits of information and communication technologies for direct poverty alleviation worldwide, Kenny (2002) and Souter (2005) suggested that the radio is by far the cheapest electronic communication technology, quoting an average cost of receivers as $10.00 or between $70.00 and $100.00 for the wind-up models. At the time of this study, one could purchase a radio for $5.00 in Ghana.

The radio is a particularly useful mass medium for extension because it is readily available. A recent audience research report by the Ghana Broadcasting Corporation (GBC) indicates that 97.3 per cent of respondents in a nationwide survey (sample size: 3173) own radio sets; 98.7 per cent listen to the radio regularly, and 75.0 per cent listen to the radio every day (GBC, 2001). Fig. 1 shows the results for the rural households in the cocoa-producing regions (YES = household owns a radio set; NO = household does not own a radio set).

In addition, the radio is relatively affordable, and information can reach households directly and instantly throughout the country. Consequently, the radio has penetrated deep into otherwise inaccessible rural areas (Osborn & Landorthe, 1995). Another advantage of radio communication is that despite its mass audience, a good presenter can make programmes seem very informal and personal, giving the impression that an individual listener is being spoken to directly (Garforth, 1994). However, the radio has its limitations. Batteries may be expensive or unavailable, especially in rural areas. There may be no repair facilities when it breaks down. People often listen to the radio rather casually

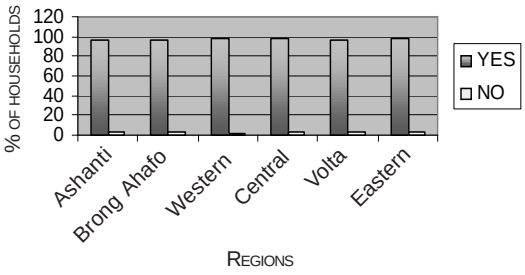

Fig. 1. Ownership of radio sets in the cocoa regions, Ghana.

(Source: Ghana Broadcasting Corporation, Accra)

whilst engaged in other activities (Garforth, 1994). The latter problem may be overcome if prior notice is given of an intended broadcast. The perception that the radio is a one-way flow of information may have been overcome in many communities by improvements in telecommunication allowing call-in programmes (Bennett, 2002).

The objectives of the study were to assess farmers' perspectives on the state of cocoa extension in the context of recent institutional changes (merger of cocoa extension, formerly carried out by the Ghana Cocoa Board, with mainstream Ministry of Food and Agriculture extension service with its attendant retrenchment or retraining of extension staff or both) in the cocoa sector, identify farmers information sources, and provide a general overview of the state of the cocoa-based agricultural information and knowledge system.

Materials and methods

A 'mixed method' approach (Neuman, 2004) involving the use of focus group discussions, questionnaire survey, and in-depth interviews was used to elicit information from farmers. Twenty-five focus group discussions were followed by administering questionnaires on 350 randomly selected cocoa farmers using a two-stage stratified sampling procedure, the sample size being determined by procedures suggested by Casley & Kumar (1989). After the questionnaire survey, 10 farmers were purposively selected and interviewed for further clarification and insight. The study was carried out in six cocoa-growing communities in the East Akim (Tontro, Bososo and Obodanase) and New Juaben (Akwadum, Oyoko and Effiduase) districts in the Eastern Region of Ghana between November 2004 and May 2005.

Results

Sample characteristics

Studies have shown that cocoa farmer characteristics such as age, marital status, number of children, and level of education have a bearing on farm management behaviour and decision-making processes (such as adoption); and, hence, agricultural output (Donkor, Henderson & Jones, 1991; Boahene, 1995). The sexes were fairly represented in the sample, and most farmers were married (82.7%) with a mean of 9 (the median and mode were 6) children (Table 1).

Over 60 per cent of the sample was aged 50 or more, once again (COCOBOD, 1995; MASDAR, 1998) reflecting the ageing nature of Ghanaian cocoa farming population (Table 1). In education, over half the sample (59.5%) had some form of education ranging from basic primary education to college or university. Gender correlated positively and significantly ($P < 0.01$) with education (Cramer's V = 0.229, $P = 0.001$, 2-tailed), and the differences between men and women were significant ($\chi^2 = 40.487$, df = 10, $P < 0.01$). Age also showed a negative but significant correlation with level of education (Spearman's rho = -0.199, $P<0.001$, 2-tailed).

Socio-economic characteristics

Mean land under cocoa was higher than has been reported elsewhere (MASDAR, 1998; COCOBOD, 1995; Boahene, 1995; Appiah, 2004), though the mean yield of dry beans of 206.9 kg ha^{-1} (Table 2) was lower than the 250-350 kg ha^{-1} often reported (e.g., FAO/World Bank, 1986; MASDAR, 1998; Donkor *et al*., 1991; Appiah, 2004). Highly significant differences were found

TABLE 1

Personal Characteristics of Sample

Variable	*Characteristic*
Gender: Male	50.4%
Female	47.8%
Age groups (years)	2.5%: 20-29 years
	10.1%: 30-39 years
	25.20%: 40-49 years
	27.7%: 50-59 years
	33.5%: 60 and above years
Marital status	82.7%: Married
	3.6%: Single
	5.8%: Divorced
	7.6%: Widowed
Number of children (mean)	9.6
Number of children with own farms (mean)	4.9
Number of children helping respondent on the farm (mean)	4.9
Level of education (categories)	39.1%: None
	22.7%: Primary
	30.6%: Junior secondary
	4.0%: Senior secondary
	1.6%: College/University

Source: Survey data. Percentages may not add up to 100 because of non-response

between gender and yield (t = 2.666, df =271, P = 0.008, 2-tailed). Cocoa farmers could be classified into three production classes (low, medium and high) by their level of management and ultimately, yield (FAO/World Bank, 1986). In this sample, 66.7 per cent were low class, 29.0 per cent medium, and only 4.3 per cent in the high class category (Table 2).

Relative to the television, the radio is more affordable to farmers, perhaps reflecting the low incomes of many farmers who cannot afford television sets (Table 2). This study found highly significant differences (P<0.01) between men and women in the ownership of radio (χ^2 = 20.667, df = 4, P =0.000, 2-tailed). However, differences in the ownership of television sets were not significant (P<0.05) (χ^2 = 5.983, df = 2, P = 0.05, 2-tailed). Comparing the two districts, the study found significant differences (P<0.05) between East Akim and New Juaben farmers in the ownership of radio (χ^2 = 45.207, df = 4, P = 0.04, Phi [correlation coefficient] = 0.3816, P = 0.003, 2-tailed) and television sets (χ^2 = 8.774, df = 2, P = 0.023, 2-tailed). In both cases, New Juaben farmers were found to be more likely to own radios and television sets (Table 3), reflecting perhaps the significant differences (P<0.01) in cocoa yields (kg ha^{-1}) (t = 2.543, df = 273, P = 0.033).

However, though class of farmer correlated positively with ownership of radio (Cramer's V = 0.099, P = 0.489) and ownership of television sets (Cramer's V = 0.042, P = 0.921), no significant differences (P<0.05) were found between the three farmer classes and ownership of radio (χ^2 = 5.434, df = 6, P = 0.89) or television sets (χ^2 = 0.492, df = 3, P = 0.921).

Information sources

Most farmers (67.2%) relied on their social networks (friends, neighbours, family members) for information and advice on cocoa. Only 15 per cent regarded extension agents as their main

TABLE 2

Socio-economic Characteristics of Sample

Variable		*Characteristic*
Total land size (ha) (mean)		12.57 (SD 8425) (median = 4.0)
Total land under cocoa (ha)		6.54 (SD 59.81) (median = 2.0)
Yield (kg/ha)		206.9 (SD 255.71) (median = 147.6, mode = 156.3)
Class of farmer		
Low		66.7%
Medium		29.0%
High		4.3%
Ownership of radio	Yes	68.7%
	No	30.9%
Ownership of television	Yes	21.2%
	No	78.8%

Source: Survey data SD = Standard deviation NB: Percentages may not add up to 100 because of non-response

TABLE 3

Ownership of Radio and Television Sets by Districts

Ownership of electronic gadgets	*District*			
	New Juaben		*East Akim*	
	Frequency	*%*	*Frequency*	*%*
Radio				
Yes	149	76.02	78	50.64
No	7	23.98	76	49.36
Total	196	100	154	100
Television sets				
Yes	89	57.80	26	16.88
No	65	42.20	128	83.12
Total	154	100	154	100
N	196		154	

Source: Survey data

source of information (Table 4). This may be indicative of the poor state of extension support for farmers, because over 80 per cent of farmers reported not having seen an extension agent in a year (Fig. 2).

When farmers were asked to indicate their preference for particular information sources, the radio was clearly the preferred information source, with television and agents of the licensed buying companies also featuring well (Fig. 4).

Further evidence of the poor state of extension support to farmers comes from farmers' responses to the statement, '*Extension support for cocoa farmers at the moment is very poor'* (Fig. 3), with 83.4 per cent of farmers agreeing to it.

This study found no significant difference ($P<0.05$) between men and women and their main ($\chi^2 = 7.035$, df = 10, $P = 0.833$) and preferred information ($\chi^2 = 9.339$, df = 10, $P = 0.522$, 2-tailed) sources.

Information needs

Farmers showed during the focus group discussions that their main information needs were the following:

- Sources of improved seeds, insecticides, fungicides, and pruners. Farmers were particular about seeds because they mentioned that the use of unproductive seeds in the past had been a major cause

TABLE 4

Farmers' Main Source of Information and Advice

Source	*Frequency*	*%*
Other farmers/family	205	67.2
Extension officers	48	15.7
Licensed buying agents	20	6.6
Input dealers	6	1.9
Others	16	5.3
Not answered	10	3.3
Total	305	100.0

Source: Survey data

week

Fig. 2. Contact with extension agents.

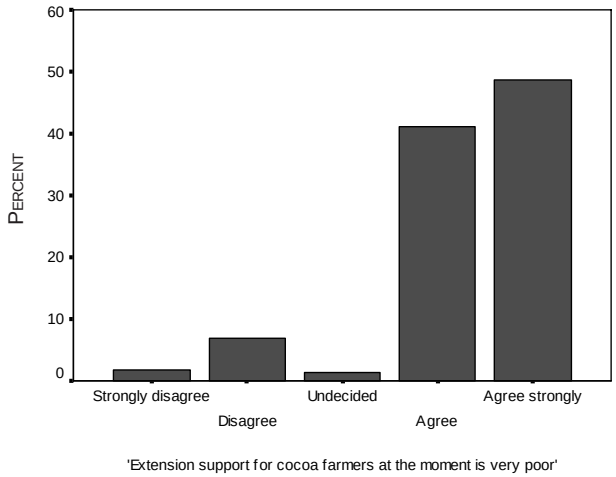

Fig. 3. State of extension support to farmers.

of their low yields.

- Sources of credit available to cocoa farmers and its cost.
- Uses to which they could put some of their cocoa processing by-products (such as sweating and pod husks) because they had learnt that these could be converted into useful products such as soaps (the husks), gin, brandy and wine (the sweating).

Discussion

As the Ghanaian economy is heavily dependent on cocoa production, and no evidence at the moment suggests shifts in this dependence in the foreseeable future, productivity should be beefed up in the supreme interest of all stakeholders (farmers, the government, researchers, extension personnel and others whose livelihood depends on the fortunes of the cocoa sector). Information and knowledge have important role to play in such efforts. This study has shown the poor state of extension support to cocoa farmers. The structural changes in extension service support to cocoa farmers, which started in 2000 with the objective of introducing 'more cost-effective extension' (MoFEP, 2005:1), has unfortunately resulted in farmers being deprived of extension support (Fig. 2 and 3).

This study found no evidence to support the assertion by the committee set up recently by the government to review the state of cocoa extension since the structural changes that 'majority of farmers think that cocoa extension service has improved over the last 3 years' (MoFEP, 2005:2). On the contrary, most farmers in this study (83.4%) affirmed that extension support for them was very poor (Fig. 3). Though farmers make extensive use of their informal social networks of friends, neighbours, relatives and cocoa

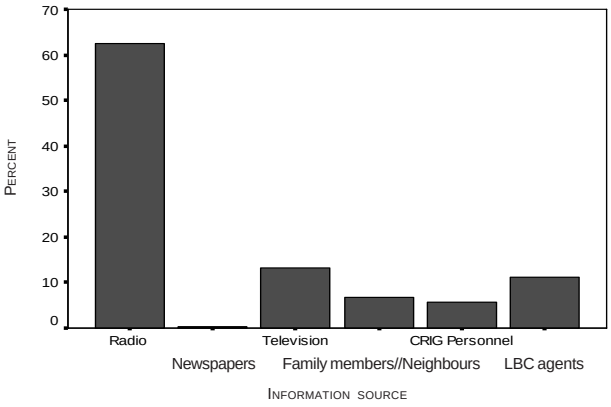

Fig. 4. Farmers' preferred information source.

buying agents to seek information and advice, the findings of this study suggest that the radio is the key in any effort to reach a mass of people at the same time, and at a relatively cheaper cost. The potential of the radio to achieve this has been shown elsewhere (Garforth *et al.*, 2003; Coldevin, 2003; Odame & Kassam, 2002).

Modern information and communication technology (ICT) such as the Internet remains the technology for the future for many farming communities in the developing world (LEISA, 2002). The radio, an 'old' technology, has penetrated deep into otherwise inaccessible rural areas. The radio is a dominant, effective and cost-efficient medium that caters for the information needs of literate and illiterate populations (Lucas, 1999). Liberalizing the airwaves in Ghana in recent times has raised the status of the radio as a channel of information flow, especially to rural communities. The radio is affordable and readily available. Over 90 per cent of respondents in the survey by the Ghana Broadcasting Corporation (GBC, 2001) own radios. The same survey showed that less than 10 per cent had television. The radio is, thus, the channel to reach the poor and inaccessible (Kenny, 2002).

Baah (2003) showed that many radio stations in the cocoa-producing regions are already broadcasting agricultural programmes, which could be used as a platform for tailor-made information to cocoa farmers. The criticism that radio is a one-way flow of information has been largely invalidated by improvements in telephone communication all over the country. Farmers can and do respond to broadcasts, and could potentially influence the contents of radio programmes. However, a lot of work needs to be done to make the radio more 'participatory' and relevant to the needs of farmers. The mere existence of several radio stations does not equate to relevant, incisive and timely information provision.

Over 90 per cent of the radio airwaves are now dominated by privately owned and controlled frequency modulation (FM) radio stations with a commercial agenda, primarily to serve the needs of the booming buy-and-sell trading sector, and also the increasing demands for social information (e.g., funeral announcements and music). The FM stations in the cocoa-producing regions have, however, shown (Baah, 2002, 2003) their capacity and willingness to accommodate the interests of farmers if empowered (Table 5). Audience research needs to be undertaken to find out the kinds of information that farmers want, the format in which it is to be delivered, and the desirable times and frequency of broadcasts. Farmers must be involved in developing programmes to enhance ownership and community identification with the communication products, an important pathway to establishing community-based radio broadcasting. Such radio broadcasts would complement other communication strategies such as individual farm visits, open days, on-farm studies, and use of leaflets and pamphlets.

Conclusion

The radio has broad appeal. It is relatively cheap and accessible to most rural households. It has helped to change rural communities worldwide by making them aware of developments around them. Improvements in telecommunications have removed a major drawback of the radio, namely

TABLE 5

Radio Stations Surveyed in the Cocoa-growing Regions, Ghana

Region	*Radio station*	*Location*	*Agricultural development programme*	*Charges(¢)*	*Duration (min)*
Ashanti	Fox FM	Kumasi	*Asanteman Nkosuo*	600,000.00	120
	Garden City Radio	Kumasi	*Akuafo nfa adwenpa*	600,000.00	90
	Kapital Radio	Kumasi	*Abibigro*	600,000.00	60
	Otec FM	Kumasi	*Farmyard*	600,000.00	60
	Shaft FM	Kumasi	*Akuafo mo*	200,000.00	60
	Ash FM	Kumasi	*Akwaba*	150,000.00	60
Brong Ahafo	Radio Bar	Sunyani	*Akuafo monsom*	200,000.00	60
Eastern	Radio Biyac	Akim Oda	*Akuafo adamfo*	200,000.00	60
	Life FM	Nkawkaw	*Kuayemu mpumtuo*	300,000.00	60
	Eastern FM	Koforidua	*Omanbapa*	600,000.00	60
Central	Radio Central	Cape Coast	*Kotokoraba special*	720,000.00	60
Western	Twin-City Radio	Takoradi	*Akuafo mo*	225,000.00	45
Volta	Volta Star	Ho	*Akuafo ayekoo*	1,000,000.00	60

Source: Baah (2003). * 1 US$ = 9,420.00 Ghanaian cedis (Interbank exchange rate. Online: www.Ghana.gov.gh/news. Accessed on 28/12/05).

the inability of listeners to respond to broadcasts. Now listeners can potentially influence the agenda for programmes.

This study has adduced evidence suggesting that after the merger of cocoa extension with mainstream Ministry of Food and Agriculture extension services in 2000, the state of cocoa extension leaves much to be desired. It has also shown that many farmers own radios, and indeed prefer radios as the medium for communicating research-based and other information. Research institutes like Cocoa Research Institute of Ghana now have the opportunity to reach out to their clientele. Although research institutes may not be endowed (or even mandated) to carry out mass extension, the radio could provide a potentially cost-effective and unique avenue for researchers to interact with end-users of technology.

It is suggested that from the evidence in this study, the radio should be the main channel through which cocoa farmers are provided with needed information about production, marketing and allied information. The radio would provide direct communication with all cocoa farmers and even reach other residents of the cocoa rural communities to enhance literacy.

Acknowledgement

The technical assistance of Mr Samson Duodu is acknowledged. The author is grtateful to Mr E. G. Asante, formerly Head of the Social Science and Statistics Unit at CRIG, for reviewing the paper. This paper is published with the kind permission of the Executive Director of CRIG.

REFERENCES

Appiah, M. R. (2004) *Impact of cocoa research innovations on poverty alleviation in Ghana*. Fellowship Inaugural Lectures, Ghana Academy of Arts and Sciences, Accra.

Baah, F. (2002) Towards a pluralistic approach in extension services delivery to Ghanaian cocoa farmers. *J. Ghana Sci. Ass.* **4** (2), 78-82.

Baah, F. (2003) *Reaching cocoa farmers via the radio.* Report on the CRIG radio broadcasts in the cocoa regions (unpublished). Tafo: Cocoa Research Institute of Ghana.

Bennett, N. (2002) Connecting farmers worldwide through radio. *Leisa* **18** (2), 20-21.

Boahene, K. (1995) *Innovation adoption as a socio-*

economic process: The case of the Ghanaian cocoa industry. Amsterdam: Thesis Publishers.

Casley, D. J. & **Kumar, K.** (1989) *The collection, analysis, and use of monitoring and evaluation data*. Washington DC: The World Bank / Johns Hopkins University Press.

COCOBOD (1995) *Report on causes of decline in cocoa production and measures to revamp the industry.* Accra: Ghana Cocoa Board (COCOBOD). 103 pp.

Coldevin, G. (2003) *Participatory communication: Key to rural learning systems*. Rome: FAO.

Donkor, M. A., Henderson, C. P. & **Jones, A. P.** (1991) Survey to quantify adoption of cocoa production technologies in Ghana. FSU Research Report 3. Tafo: Cocoa Research Institute of Ghana. 69 pp.

FAO/World Bank (1986) *Draft report on third cocoa project for Ghana*. Ghana Agricultural Sector Review, World Bank Report No. 5366-GH, Washington DC: The World Bank.

Garforth, C. (1994) *FAO guide to extension training.* Draft Chapter: Extension and communication, pp.1-37. Rome: FAO

Garforth, C., Khatiwada, Y. & **Campbell, D.** (2003) Communication research to support knowledge interventions in agricultural development: Case studies from Eritrea and Uganda. *Paper presented at the Development Studies Association Conference, Glasgow, 10-12 September 2003.*

GBC (2001) *Audience research report on nationwide survey on radio and television*. Accra: Ghana Broadcasting Corporation (GBC). 20 pp.

GoG (1995) *Survey of cocoa farmers and farms*. Final Project Report (Project GCP/INT/632/COA). Accra: Government of Ghana / Ghana Cocoa Board.

ISSER (2005) *The state of the Ghanaian economy in 2004*. Legon: Institute of Statistical, Social and Economic Research, University of Ghana.

Kenny, C. (2002) Information and communication technologies for direct poverty alleviation: Costs and benefits. *Dev. Policy Rev.* **20** (2), 141-157.

LEISA (2002) Changing information flows: Editorial introduction. *Leisa* **18** (2), 4-5.

Lucas, F. B. (1999) *Rural radio in the Philippines.* Online: http://www.fao.org/sd/Cddirect/Cdan0026.htm. Accessed on 22/12/05.

MASDAR (1998) *Socio-economic study of cocoa farming in Ghana*. Consultancy Report, Accra: Ghana Cocoa Board / MASDAR International Consultants.

McQuail, D. (1983) *Mass communication theory*. London: Sage publications.

MoFEP (2005) *Report of the review of cocoa extension under Ministry of Food and Agriculture* (The Cocoa Extension Review Committee). Accra: Ministry of Finance and Economic Planning (MoFEP), Ghana.

Neuman (2004) *Social research methods: Qualitative and quantitative approaches,* 5th edn. Boston and New York: Allyn and Bacon.

Odame, H. H. & **Kassam, A.** (2002) Listening to stakeholders: Agricultural research and rural radio linkages. *ISNAR Briefing Paper* **48.** The Hague: ISNAR.

Osborn, P. & **Landorthe, A.** (1995) A review of the trends in the supply of information for rural development from Europe to ACP countries. In *Proceedings, International Seminar on the Role of Information for Rural Development in ACP Countries: Review and Perspective*s, pp. 139-155. Montpellier, France, 12-16 June 1995.

Souter, D. (2005) *The economic impact of telecommunications on rural livelihoods and poverty reduction: A study of rural communities in India, Mozambique and Tanzania*. London: The Panos Institute. Online: www,panos.org.uk/reports. Accessed on 22/12/05.

World Bank (2004) *Democratizing HIV Communication: Development Outreach*. Washington DC: The World Bank. Online: http://www1.worldbank.org/devoutreach/july04/extonly . Accessed on 09/09/05.