

**NEW TECHNOLOGIES, NEW DEMANDS AND NEW LITERACIES:
The Changing Literacy Practices of Fishing Communities in Bangladesh and
Ghana**

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Abstract This paper examines the changing uses of literacy in fishing communities in Bangladesh and Ghana. Poverty and illiteracy are common features in representations of fishing communities. Some have argued that formal schooling does not prepare children for a future in fishing, and that formal educational qualifications are rarely required to enter the labour market. These views have sustained a discourse on educational deficit and marginality. However, as documented in this paper's cases from Bangladesh and Ghana, there is evidence that vernacular and official literacy practices, and ICT, are becoming central to the lives and livelihoods of fishing communities. It is argued that the use of mobile phone technology, and practices of marketing, governance and environmental protection have created new opportunities and demands for literacy use and for technical knowledge. The observation of 'new literacies' in fishing livelihoods challenges the conventional view of a simple 'trade-off' between fishing livelihoods and schooling.

Introduction

The topic of literacy in fishing communities has generated growing attention in recent years, but has been constrained by the dominant assumptions of 'deficit discourses' (that is FAO 2007). This reflects a wider tradition of presenting small-scale fisheries in terms of poverty and social and physical marginality (Bene 2003). This paper explores a contrasting perspective, and describes the role of various types of literacy in the livelihoods of fishing communities in Bangladesh and Ghana. Vernacular (informal) literacy practices continue to be central to the lives of fishers and fish traders, but in addition, as this paper argues, the adoption of information and communication technologies (ICT), such as mobile phones, and the literacy requirements of fisheries governance, have created 'new literacies' that are increasingly important for fishing livelihoods and environmental protection.

'New Literacies' refer to forms of text, genre and practice, produced for example by the use of new technologies or particular forms of social and institutional arrangement (see Street 2003, Gee 2003, Lankshear and Knobel 2006). They involve transformations in the way we learn, communicate, and access

information (Lankshear and Knobel 2003), and are increasingly 'multi-modal', located within interactive digital and audio and semiotic interfaces (Kress and van Leeuwen 2002, Gee 2003). These contrast considerably with established concepts of literacy such as those that are included in school curricula. As we argue, New Literacies are transforming the communicative environments and practices of fishing communities and suggest a re-appraisal of the relationship between fishing livelihoods and education.

The ethnographic literature on fishing communities has historically exoticized fishing communities, presenting their distinctive and traditional forms of cultural practice as markers of otherness. As Ram (1991) wrote in her study of Mukkuvar women fishers in South India; 'To write of the Mukkuvars of Kanyakumari is to write of difference' (xi).

The Mukkuvars are located on the outer fringes of an ancient civilisation. Beyond them is the sea, on which their livelihood depends, offering them a ready if provisional escape from the low status that caste society affords them. Their geographical location is a metaphor not only for the social and economic marginality of the Mukkuvars but for the possibilities of an independent cultural identity which this marginality provides. (Ram 1991: xiii)

In ways unanticipated by Ram's celebration of the Mukkuvar's marginal cultural independence, such portrayals of fishers may have supported representations of marginality that spill over into educational and developmental discourse. Within such representations, orality (commonly associated with illiteracy) is contrasted with main-stream literate traditions and schooling and assumed to be the cause of under-development.

This portrayal of marginality, provides a static image at odds with more recent research that provides counter-narratives, representing fishing cultures and economies as dynamic and adaptable (Bene 2003; Kraan 2009). As globalisation integrates even the smallest fishing villages into large scale markets, this increasingly involves the innovative use of new information and communication technologies (Overå 2006). Furthermore, discourses of ecosystem services, biodiversity, and co-management re-position fisheries to a more central position in issues concerning conservation and food security. In addition to vernacular communicative practices, literacy may thus increasingly be necessary in order to access new types of (non-traditional and non-schooled) knowledge required to participate in co-management and new ways of marketing. These areas of technical knowledge are neither 'indigenous', nor are they necessarily acquired through the situated practices of fishing.

There are reasons to question the popular association of fishing communities with illiteracy or low levels of literacy. These include long-term trends in improved educational access. Raymond Firth's classic 'Malay Fishermen' (1966) noted the rapid rise of education and literacy in fishing communities. The widening of educational participation that he observed was part of the global trend toward mass literacy. Despite on-going inequalities, literacy rates have generally continued upward, with international commitments to universal primary education in the

last decades (UNESCO 2005). This is not always recognised in accounts of literacy in fishing communities which argue that education is either undervalued by fishing communities, or beyond their reach. Fatunla (1996), for example in her study of education of migrant fishers in Nigeria argued that '[m]any children dropped out of school when they saw greater benefits in fishing than listening to a jack of all trades teacher who could not even inspire the pupils' (51). A similar argument was made by Ram (1991):

[m]ost fishing households still regard fishing as the most reliable and readily available form of male employment, and to train the boys in the trade, begin their apprenticeship by seven or eight. The education of boys is therefore passed over in favour of their traditional training out at sea (223).

This argument seems to present illiteracy as an inevitable occupational hazard of fishing livelihoods, as fishing communities 'trade-off' education against livelihoods (Petersen and Bene 2008). The argument appears reasonably convincing, but is weak in relation to a couple of important details.

Firstly, the deficit argument fails to recognise the possible utility of literacy within fishing communities. Might it not be that an apprenticeship to fishing livelihoods involves acquiring abilities in literacy? If that was not the case in the past, it is clearly becoming necessary in many contemporary contexts. The argument also appears to neglect possibilities that education is valued as a social good, or for opportunities of socio-economic mobility (that is occupational diversification). Secondly, the argument seems to fail when we look at the available research evidence, as in the case of Kerala:

Since fishermen as a group are known to be backward, it would be expected that literacy rates would be lower than the populace as a whole. This however, is not quite borne out by the information available (Gulati 1984: 144)

There are few systematic studies of literacy in fishing communities. A review of existing literature found that in Africa and South Asia (areas with the highest illiterate populations), some fishing communities had higher levels of literacy than their agricultural counterparts, and this merits further research (Maddox 2007). In some contexts fishing communities have low levels of school enrolment. However, in other contexts where in-depth studies have taken place, well-established literacy traditions are revealed (for example Doronila 1996, Maddox 2001). At the same time, one should recognise that the costs of education (such as user fees, uniforms, texts books), and lack of provision in remote coastal communities may make it difficult for children of fishing communities to access and complete their education.

A further line of argument relates to the role of literacy in fishing communities and the vibrancy of literate environments. There is a strong case to be made that literacy practices are endemic in many fishing communities, being associated with written traditions involved in communication, credit, and religion. Verrips' paper on 'Ghanaian Canoe Designs' (2002) for example, provides insights into the

literacy environment of fishing communities. The paper describes the markings and writing on Ghanaian canoes and notes that the complex adornment includes a wide range of iconography, pictograms, designs and written texts. These include names, sayings, proverbs from those with religious and moral content, to commercial associations, names and places, and those indicating sexual prowess and fertility:

The texts are messages and statements, though sometimes cryptic ones, which are used to characterise and distinguish, to tease and challenge, to criticise and joke, to invoke and ward off. Together with the other decorations they turn the canoe – and this crucial means of production on which the lives of the fishermen and their families depend – into a ‘speaking’ object, and entity with a ‘voice’, a ‘messenger’, or a vehicle of meaning with a particular identity (Verrips 2002: 59).

The canoe designs not only highlight a lively literacy environment, but also indicate an inter-textual link to broader practices of literacy within the communities. This level of ethnographic detail on the literacy environment is rare in accounts of fishing communities, which often contain rich detail on fishing technologies and the natural environment, but fail to recognise what Barton (1994) describes as the ecology of written language. In many fishing communities, there is thus a well established ecology of written language. This not only relates to processes of fish catching, but to wider aspects of markets, communication and culture.

Textual Ecologies

Within the fishing literature, there are frequent references to ‘literacies’. Many of these refer to literacy in a broad metaphorical sense, for example in terms of *ecological literacy*, *environmental literacy*, *market literacy*, *ocean literacy*, *graphic literacy*, *legal literacy*, *marine literacy* and *sonar literacy*. These terms illustrate the occupational character of fishing, the dynamics of production and technology. They also point toward particular forms of technology, knowledge systems and informal learning, so-called ‘tacit knowledge’, that are located within what Lave and Wenger (1991) would call ‘communities of practice’. These terms illustrate the role of literacy in new forms of technology. Drouin (2001), for example, describes ‘*sonar literacy*’ as the ability to interpret the images generated by fish-finding equipment, noting that ‘you have to be able to read the screen’ (*ibid.*: 41). This perspective on diverse forms of literacy practices is informed by the ‘New Literacy Studies’, which views literacy (and literacies) as a plural and diverse form of social practice that get their character and meaning from the social and institutional settings in which they are situated (Street 2003, Gee 2000, Collins and Blot 2003).

The recent advance of digital technologies, such as in GPS, and GSM based mobile phone technologies have created New Literacies which are now integral to the lives of many fishing communities, including those of the remote Bangladeshi and coastal Ghanaian fishing villages, described below. As Abraham (2007)

argues, mobile phone based facilities such as sms texts are being widely used for personal communication, weather alerts and market information. While one should be wary of technological determinism, and face-to-face communication still is all-important in relation building and contract negotiation (Molony 2008), it is clear that digital technologies provide new kinds of communicative 'affordance' (Kress and van Leeuwen 2002), that are being used in fish finding, market strategies, marine safety and governance (Overå 2006, Abraham 2007, Jensen 2007, FAO 2007). This raises issues that merit further research, for example on the ways that people learn and use literacy; the relationship between spoken and written (digital) communication; choices of language and script, and how learning with new technologies might assist fisheries management. These issues are examined in the case studies below.

Literacy Practices in Bangladeshi Fisheries

The first example is drawn from a series of ethnographic fieldwork visits to in-land fishing communities in the North West and North East of Bangladesh (1997-1999, 2005, 2008). In the Bangladeshi context, despite widespread educational inequality, literacy practices are an established feature of fishing communities. Maddox (2001) found that literacy practices (particularly the use of written records) were widespread among artisanal fishers, and regarded as a requirement for fishing livelihoods, by fishers who had not attended school. Some of them also kept rudimentary written records, but did not consider themselves to be literate (Maddox 2001). The occupational literacy practices of Bangladeshi fisherfolk have a distinctive purpose and character. Some involve the use of written records; others are associated with bureaucratic processes of fisheries management. There are also New Literacy uses involving mobile phones (including sms texts) that we will discuss later in the paper.

Literacy is widely used for record keeping, particularly in financial transactions involving credit, which is integral to economic activity, and for coping with seasonal fluctuations in income. Floodplain aquaculture of northern Bangladesh makes a significant contribution to food security and economic wellbeing (Mohsin 2007; Islam and Dickson 2007). However, this livelihood is subject to strong seasonality, and so written records of credit and debt, as income smoothing is a pervasive feature of economic life. On a daily basis, written records are also integral to fishing livelihoods, including records of post-catch distribution of fish, and in the management of market transactions.



Figure 1: 'Written record keeping in Bangladeshi inland fisheries' (Photography copyright, Maddox)

The literacy practices related to credit and financial management, range from informal record-keeping, often on scraps of paper or the back of cigarette packets, to formal ledgers in large-scale business (Maddox 2001). These can largely be described as 'vernacular' literacy practices (Barton and Hamilton 1998), or what Blommaert (2008) calls 'grassroots literacy'. They are informally, and locally learned and used, and are not subject to external rules and standardisation by formal institutions. These texts are often for personal records, and for face to face communication. As such, they may only be understood by their author, and in relation to particular social contexts. They do not follow the conventional codes of genre – and in that sense, appear *ad-hoc*. These texts are normally written in Bengali language and script, which is the main spoken language in Bangladesh.

The vernacular, every-day literacy practices in Bangladeshi fishing are characterised by the genre of 'lists', associated with grading and distribution of fish for market, records of fish sold and their prices, and records of money lent and borrowed. These informal texts involve a high degree of author agency, that contrasts with the formality of 'pass-books' for credit and saving schemes, where the rules and regulation of genre (textual features, format and style) resides with the office holders of savings institutions.

A contrasting set of texts and practices are associated with the institutions of community-based fisheries management. In-land Bangladeshi fisheries are increasingly subject to governance through co-management arrangements. Written documents involved in fisheries management include legal – bureaucratic documents associated with tender and lease arrangements, access and group membership; organisational rules and constitutions; and financial management;

and literacy practices in technical training. These texts are directed to increasing production, improving equitable access as well as ecological management. They are associated with new forms of knowledge, discourse and literacy practice – for example on markets and yields; legal bureaucratic process of access, equity and rights; and on bio-diversity, resource management and sustainability. These processes involve the management of ‘community-based organisations’ and conceptions of ‘group’ and ‘community’ that co-exist and at times compete with traditional management systems and institutions. The texts and literacy practices associated with community-based management can be described, following Barton and Hamilton (1998) as ‘dominant literacies’. Unlike the vernacular practices of record keeping, these are characterised by formality, standardisation and institutionally produced and governed practices, with formal rules and textual norms. These often involve textually mediated interfaces with government and advocacy organisations. The genre of these ‘dominant literacies’ include narrative text, and formal language often containing technical terms and concepts which imply familiarity with scientific and technical knowledge. The emergence of these new forms of literacy associated with governance therefore place new demands on the literacy capabilities of fisher folk. Communities with low levels of education are at a significant disadvantage. In a series of focus group discussions with male and female fishers in 2008, Maddox and Moore¹ found that fishing communities in the North East of Bangladesh considered engagement with bureaucratic texts necessary for their occupational wellbeing. However, as they noted, only the most highly educated members of the community were able to cope with such practices, and this created an educationally derived rationale for the allocation of leadership roles, and a reliance on literacy mediation from supporting organisations. This requirement for mediation was not always regarded as helpful, and people indicated its potential to reproduce unequal power dynamics within communities, and between communities and fisheries management organisations. The dependency on outside support suggests that low levels of literacy and schooling can limit the autonomy and efficiency of community-based initiatives.

Literacy practices in Ghanaian fisheries

The second example relies on data collected during fieldwork in fishing communities and fish markets in Ghana between 1991 and 2008. A wide range of fishers and traders were interviewed, mostly in the Central Region fishing town Moree and in the fish markets of Accra and Tema Fishing Harbour. In Ghana, 64.2 percent of people employed in fishing have never been to school, which is well below the national average of 49.1 percent (GSS 2005: 253). Though the formal literacy rate among fisherfolk therefore is considerably lower than that of the national average (Mensah *et al.* 2006), their educational level corresponds to the level of those who work in occupations such as farming, hunting and forestry.

There is however, no clear correlation between having a low education level and being poor in fishing communities. Indeed, most of the richest canoe owners can neither formally read nor write (Overå 1993; 1998), but are fluent in

'vernacular literacies' and keep quite complicated records of debts and debtors in their heads, and can interpret the symbols painted on canoes, fish boxes and buildings. Canoe names, for example, are written in English (for example Town Hall, City Boys, Bible) or in the local language, here in Fante, (*Emo na edukwa* – 'rice and beans', *Sika wo pom* – 'there is money in the sea', *Gyaakontaabo* – 'stop envying me'), or are simply numbers with a specific meaning (50-50, 6&9, \$6, 007). The names are intended to be catchy and easy to remember, and decorations and ornaments make each canoe recognisable also for those who can not read the names. Baskets of smoked fish are often sent long distances from the coast and are received by cooperation partners in inland fish markets like Kumasi. Pieces of cloth of a certain pattern are then used to identify the owner of the fish (Overå 1998). The cooperation partner can also tightly wrap the money made after selling the fish with the specific cloth attached, and sends it back to the fish owner on the coast with another trusted trader or even with the truck driver. This is an informal money transfer system that requires a high degree of trust. The pre-arranged agreements between the fish trading partners on how to wrap the money is an insurance strategy against theft, since the intermediary knows that he will be the only culprit if money disappears.

The practical skills of fishing and fish marketing, and a thorough knowledge of fishing grounds and markets, and not the least of people, are crucial to manoeuvre and make the right decisions in the fisheries. Social skills are extremely important to succeed economically. Entrepreneurs depend on having loyal cooperation partners whom they can entrust with large sums of money and to whom they can delegate the responsibility of monitoring the activities of workers like crew members and fish smokers. Though formal literacy and to some extent numerical literacy is not necessarily a requirement for many of these cooperation partners, there are a number of instances when fishers and fish traders depend on literacy mediation, and 'proximate literacy' (Basu and Foster 1998; Maddox 2007) by relying on others who are literate to read and write for them.

Each canoe company has a secretary. The secretaries are mostly men with very modest schooling, though occasionally they have secondary education. Some have worked in other non-fishing occupations elsewhere before. The most important skill of the secretary is his accounting abilities, since his main task is to keep records of catches and amounts forwarded to crew members, and quantities and prices of fish sold on credit to fish buyers. He makes periodic accounts on behalf of the canoe owner in which records are kept of the catch shares that each crew member is entitled to and has taken out as an advance, and of how much is left to be paid out at the end of the crew's contract period. Some formal literacy is of course also required for the secretaries in order to write the names (or symbols) of crew members and fish buyers in their account books. It goes without saying that the secretary is a crucial link between workers and employer and that trustworthiness is an absolute requirement.

Each fishing community has an elected chief fisherman (*apofohene*). He is the religious and professional leader of the fishers and an important link between the fishers and the government, banks and donors. When fishers migrate, the chief fisherman is also an important link to the foreign authorities in countries

like Benin and the Ivory Coast (Odotei 1991). He can guarantee the fishers' and fish traders' identity and good intentions when they apply for residence and work permits and he negotiates access to fishing grounds and markets to avoid conflict between local residents and migrants (Marquette *et al.* 2002). In most cases the chief fisherman is illiterate and relies on one or more secretaries for written correspondence and access to relevant written information on regulations, prices of equipment and when he participates in meetings at the national level. Thorough knowledge of the fisheries has been the primary requirement in order to be elected as a chief fisherman, but literacy is increasingly regarded as an important qualification of leaders. This is not surprising, since community-based management, in Ghana promoted by the DFID/FAO West Africa Sustainable Fisheries Livelihood Programme (SFLP), requires local committee meetings with minutes and written communication with the donors. Such programmes have become an important source of resources and it helps to know the 'buzz words' of their discourse. In Moree, the process of electing a new chief fisherman was recently pending for more than two years because fractions of the community had different opinions about the importance of their new leader to be elected being 'an educated man'.



Figure 2: One of the few literate chief fishermen is Ghana calling a chief fisherman colleague. The document he holds is an NGOs invitation to participate in a workshop on fisheries management.

Another important 'literacy arena' is in the purchase of imported fish. Coastal women frequently buy cartons of frozen fish in the harbours of Takoradi and Tema. Whereas vernacular literacy is sufficient in the market places, it is an advantage in relating to the more formalised cold storage companies to be able at least to write accounts and make sure one is not cheated by the sales workers. Women usually rely on friends or relatives who can assist them in this. It is also common that the driver of the truck or mini-bus in which the fish is to be taken home is active as a translator and helps with reading and control of information. Sometimes by-catch is purchased directly from trawlers and in order to organise this trade contracts need to be arranged beforehand. In Moree, semi-literate English-speaking men have been crucial intermediaries between fish traders and foreign trawler companies in the mediation of agreements and writing of contracts (Overå 2005). This is again an example of the dependence by otherwise rich and powerful canoe owners on literacy mediation. For example, one female canoe

owner and fish trader from Moree lamented that she had lost by-catch contracts by sending her illiterate captain son to negotiate with Korean trawler companies in Tema, but since 'he could neither speak English nor Chinese there was nothing he could do', as she put it.

Since the outboard motor was introduced in Ghanaian canoe fisheries in the 1960s there have been several credit programmes for the purchase of outboard motors and canoes, for example by the Agricultural Development Bank and the Rural Bank. The chief fisherman has acted as a guarantor for the credit-worthiness of applicants. According to bank staff, it is common for fishers or traders to approach the bank together with an educated relative in order to increase the chances of getting a loan. Fish traders sometimes marry educated men, such as teachers, who help them in approaching banks to get loans. Examples exist of highly educated people who have attempted to invest in canoes themselves. These enterprises tend to fail because a lack of 'inside' knowledge and limited possibility for participation and monitoring of fishing activities. Formal literacy alone is therefore not necessarily a very useful asset within the local fishery where secretaries fulfil the most necessary accounting needs, but formal literacy is increasingly becoming important at the point of intersection between the local indigenous and external resource arenas.

New Literacies and Mobile Technology

There is extensive discussion on potential benefits of new Information and Communication technologies in fishing communities (see for example Abraham 2007; FAO 2007). This can be investigated in Bangladesh, where a 'cell phone culture' (Goggin 2006) has rapidly been incorporated into the daily life. The rapid application of mobile phones in fishing communities demonstrates potential for innovative application of new technologies. This change is widely observed, as mobile phones, and use of small note-books of names, phone numbers (and occasionally, notes of credit or debt) are now commonplace.

During the Bangladesh fieldwork in 2008, Maddox observed fishers using mobile phones as a widespread daily practice. This had not been the case previously, when mobile coverage was less extensive. It represents a significant change in communicative practice, and one that has taken place largely through informal, rather than schooled learning. Mobile phones involve the development of new literacies, as people adopt sms texts as a medium of communication. These digital interfaces are quite different to writing on cigarette packets. They use print text rather than hand-writing, and necessitate reading 'English' (Roman) letters and numerals. Where Bengali and Arabic scripts were previously dominant in fishing communities, English script has been added to the communicative repertoire. This may have added benefits for people's engagement in trade and bureaucratic practices. Abbreviated text-talk incorporating English and Bengali are standard within more educated social groups. It is not clear how this will develop in fishing communities, where few people know English. Bengali text (and predictive text) are available, and may become more widely used as the technology is established.

The rapid development of cell phone culture in Bangladeshi fishing communities has created new opportunities for communication and learning, which are as yet under-utilised in the fishing sector. The advocates of mobile learning (m-learning), argue that it can support learning within socially disadvantaged groups through mobile phone technologies (Kukulska-Hulme and Traxler 2005; Prensky 2005; Swan *et al.* 2005; Mitchell and Doherty 2003; Harris 2008). This potential has in sense already been demonstrated, as fishing communities embrace new technology and new literacies.

Coastal Ghana is densely populated and fishing communities therefore had coverage relatively early. Mobile phones have rapidly become an integral ingredient in personal communication and economic life since GSM networks were established in 1995. Still, mobile phone use is not yet universal, as the poor can not afford to purchase and use mobile phones and remote rural areas are still without coverage (Overå 2008).

The importance of communication technology in fishing communities can be illustrated with two examples of telecommunication practice before the advent of the mobile phone when fixed lines were only available for the elite in urban areas. During the 1970s, trawler activity and the by-catch trade commenced. The very few who had walkie-talkies had a comparative advantage as they could contact the trawlers on the VHF radio to make contracts with trawling companies and arrange timing of pick-up of the consignments. The ability to speak English was a precondition for such walkie-talkie communication with the managers of companies and officers on trawlers and fish traders thus relied on semi-literate men who made very profitable careers this way (Overå 2005).

Also the less powerful in the fishing communities occasionally phoned before the 'mobile phone age' and they also relied on proximate literacy when phoning. Fishers and fish traders' main reasons for calling were to communicate with relatives far away and to contact the cold storage companies in Tema to make orders of imported frozen fish. During the 1990s, a WILL (Wireless Local Loop) phone was installed by a pharmacist in his shop in a fishing community. Risible the pharmacist recalls how he often had to help fishers holding the telephone receiver when they held it upside down. Since those they called rarely owned a phone, the pharmacist also had to communicate with the public communication centre in receiving and, explaining who his customer wanted to speak to and making arrangements to fetch the right person and when to call back.

With GSM coverage and increasing affordability of mobile phones, many fishers and fish traders now own phones, but this is still an asset reserved for the relatively well-off. Since the majority can not write, they do not sms much, rather they call. This represents a cost problem for those who can not write, since talking for some minutes is much more expensive than sending an sms. Many therefore use their phones only to receive incoming calls. To economise on units, 'flashing' is common. The person who receives the call identifies the one who calls on the display (which requires some form of literacy) and calls back. Often the two parties have agreed on a code whereby one call signal can signify 'call me', two call signals can mean 'I have arrived', and so forth.

Fishers say that the mobile phone increases security at sea; they can call for help if somebody falls sick or the engine breaks down or call for supplies if they run out of petrol. They can inform traders ashore about their arrival, catch quantity and timing of pick-up of catch. Fish traders more efficiently seek information about prices and fish demand in distant markets, which reduces information asymmetries and makes it possible to earn more profit and reduce spoilage of perishable fish. Fish buyers also place orders with fishers. This can create conflicts between crews and their canoe owner or creditor (normally their regular fish wholesaler) if the crew phones other traders while at sea and secretly land their catch in other locations, arriving home with little or no fish for their employer. Notwithstanding such breaking of trust relations aided by mobile phones, the technology undoubtedly facilitates planning of multiple activities, makes the coordination of workers easier, and reduces time and cost of travel to exchange information (see Overå 2006). New technologies, such as the mobile phone, may thus enhance growth as it facilitates transactions that might not otherwise have happened or would have taken place at a higher cost (Aminuzzaman *et al.* 2003).

It is clear, then, that mobile phone communication has made markets more efficient and can improve welfare for both fishers and consumers, as Jensen (2007) also finds in his study from Kerala. The mobile phone is a useful technology for those who can not write letters and e-mails, even if some degree of writing ability enhances its use value. Hence, though new technologies in themselves do not solve the social, economic and institutional dilemmas involved in fisheries, they do provide useful and practical communication tools, which require and to some extent create New Literacies.

Conclusions: New Literacies, New Demands, New Technologies

This paper has questioned a deficit discourse on literacy and fishing communities. It has argued that despite disadvantages in accessing formal education, many fishing communities have established literacy traditions. The social uses of literacy in fishing communities discussed in this paper relate to their mode of production, the need for written records and communication, and wider cultural and religious practice. In the contrasting contexts of Bangladesh and Ghana the paper highlights the changing nature of literacy practices, as evidenced by the addition of mobile phone technology (including SMS texts) to the communicative repertoire. Where 'literacy demands' are expressed by fishing communities, they may therefore relate to existing practices, the potential for uses of literacy, and the new requirements associated with the emergence of New Literacies used in communication, co-management, trade, and environmental protection. As such, they do not necessarily reflect 'illiteracy', but the need to engage effectively with established literacy traditions.

The evidence presented in this paper challenges the idea that schooling (and more specifically literacy) can necessarily be 'traded-off' against fishing livelihoods. Formal literacies, whether directly through the services of literate people or indirectly through proximate literacy, are increasingly integrated into fish mar-

keting, interaction with the formal banking system, and in management practices. Fishing communities in Bangladesh and Ghana have been able to rapidly innovate with new forms of technology, and to become competent in the use of the 'new literacies'. This has largely taken place through informal learning and mediation. Risks no-doubt remain that educational and literacy inequalities reduce the efficiency of such practices and the scope for equitable participation. Nevertheless, the recognition of existing literacy traditions and communication practices of fishing communities (rather than their absence) provides a foundation for development and change.

Notes

- 1 The Bangladeshi research in 2008 cited above was conducted by Bryan Maddox and Karen Moore (formerly Chronic Poverty Research Centre, University of Manchester) with field support from The WorldFish Center, Bangladesh, and Shumona Sharmin and Goutam Roy of BRAC.

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