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Internet Services and the Potential for Market Access for Rural Agricultural Households in Vietnam

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It is often hypothesized that access to new forms of technology such as mobile telephones and access to the internet can be used by poor rural households to improve their income prospects by helping to provide access on information and markets. With the rapid increase in the spread of such technology in rural Myanmar and Vietnam, it would be expected that such a phenomenon, if it does occur, would be starting to occur in those countries too. Consequently, a quantitative survey was organized in two different research sites in each of the two countries and a total of 611 completed questionnaires collected. Analysis of the data indicated that the technologies had indeed spread extensively in the two countries and were being used, to some extent, to assist with such information searching. However, it was found that there were significant differences between the two sites in each country, which suggests that no single strategy would be suitable to help all members of the country. Further, the meaningful search for information is not happening on a consistent or coherent basis, which indicates that some form of education would be helpful by government extension services or non-governmental organization (NGO) representatives. There are particular areas within both livestock management and rice agriculture with which respondents need some guidance.

Keywords: agriculture, information communications technology, market access, Vietnam

Introduction

Research (e.g. Walsh, 2016) has shown that food insecurity exists in the Greater Mekong Subregion (GMS) to a significant extent (see Table 1). This occurs both in urban and rural settings and in comparatively wealthy countries such as Thailand (See Table 2 for basic statistics). Researchers also reported that some local farmers have observed the emerging impacts of global climate change. Although urban areas face their own problems in this regard, the issues are more severe in rural areas because these tend to be poorer, further away from government services, have less educated people and so forth. Most people in rural areas in the GMS are part of subsistence farming households. One means of allowing them to improve their income generating opportunities is to enable them to connect with regional markets. However, to do so, those involved need more skills, knowledge, access to inputs and information about market access than they currently have. Government extension services can be helpful in these cases but, in the GMS generally, government agencies have limited resources and technical capacity to meet these demands. In some cases, non-governmental organizations (NGOs) can help to address this need and they do indeed do so in some cases. However, governments in the GMS have a tendency to mistrust NGOs for various reasons and, as a result, their activities are more limited than might otherwise be the case. With the public and civil sectors unable to completely to meet the demand for services, might it be possible for the private sector to take a role? To some extent, this is already taking place in the form of contract agriculture. In this case, the investor (an individual or company) makes a contract with individuals or groups of farmers that they will produce specific produce meeting various requirements within a definite timeframe, for which they will be paid a fee. This situation can work well when a transparent transaction takes place and both sides understand the situation and are required to hold to their side. However, these conditions do not always apply in this region, since conditions vary beyond the control of the farmers, sudden shocks can require immediate access to cash and a verbal contract might be disputed on either side.

An alternative means of involving the private sector is by encouraging those involved to help themselves through the adoption of technology. Mobile

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telephones have very high rates of penetration in the region that have come about quite suddenly. As more companies have been given permission to enter national markets, prices have declined and levels of service increased. This has included the provision of internet via smart phones and the extension of the network across more and more territory. As a result, people in both urban and rural areas have now achieved quite high levels of connectivity. In Vietnam, for example, 90% of rural residents own a mobile telephone and half of these are smartphones; some 24 million rural residents use the internet, which is the same as in urban areas (Nhung, 2017).

People use mobile telecommunications in a variety of different ways. Prahalad (2006) observed that poor people quickly learned how to use telephones to obtain market information (e.g. prices at rival fish merchants for fresh catch) and were able to use this to increase their income. Other studies have also indicated a positive link between technology adoption and poverty eradication (e.g. Mendola, 2007; Cecchini & Scott, 2003). It is not difficult to imagine how this could be. Mobile telephones can be used to give and receive information and this can include family-based information as well as social and leisure based interactions. Is this, yet, happening in Vietnam? If so, what is the role of technology in helping people to incorporate themselves into market-based activities and what problems and prospects are there? Attempting to answer these questions is the purpose of the research project reported on in this paper. The project consisted of an empirical, quantitative survey conducted in different part of two countries and used a self-developed questionnaire.

This paper next goes on to provide a literature review that is used to highlight gaps in knowledge and the creation, therefore, of a research framework that has been used to address these gaps. This is followed by a discussion of the methodology used in the project and the findings themselves are presented and discussed.

Literature Review

Mobile telecommunications differ from fixed line telecommunications in that they use radio waves rather than wires to connect users (Gruber & Verhoven, 2004). Attempts to use wireless networks are almost a century old bit it is only comparatively recently that appropriately sophisticated use of the available frequencies was introduced. New generations of mobile handsets have included so-called smartphones, which may be defined as "... mobile phone handset with advanced hardware and software capabilities that enable it to perform complex functions similar to those of laptop computers (Bin Dhim, Freeman & Trevena, 2014). Contemporary smartphones are characterised by being data generators as much as being data exchange systems and for having an easily changeable suite of apps (software programmes customarily designed for a narrow range of uses) that are mostly selected by the used rather than the manufacturer (Bin Dhim & Trevena, 2015). The use of mobile telephones and smartphones has become endemic more or less around the world. Users find that they provide benefits that psychological and offer safety, belongingness, self-esteem and self-actualisation (Kang & Jung, 2014). They are likely to choose services and apps to which their friends, family members and colleagues also use and, hence, they derive network externalities (Lin & Lu, 2011). Numerous studies have been made on the impact of smartphones and attendant technology upon various aspects of contemporary life.

Value Chains

Value chains are the successive stages of production from raw inputs (upstream) to ultimate sale and consumption (downstream). For emerging markets, getting domestic firms integrated into value chains with foreign firms (and, in due course, purely through domestic firms) represents an important developmental goal. This is one of the more significant reasons for foreign direct investment (FDI) and helps to counter many of its negative impacts. Accepting and encouraging FDI should be a transactional decision for a developing state government since it is far from being a panacea (Chang & Grabel, 2014). The means by which the domestic market can benefit from FDI are as follows:

- Direct efforts: inwards FDI is likely to produce a number of jobs, although it is not guaranteed that these will be high-value jobs and, as a result of incentives that might have been provided as inducements to potential investors, workplace relations might be problematic. Incoming investors will want to retain some leading positions for people from their home company but the remaining positions might be subject to

negotiations. In addition to income provided by job creation, it is possible that those involved will be able to learn skills and competencies which might subsequently be redeployed to the home economy. There will also be a multiplier effect as incoming investors will need their own services in terms of accommodation, education, health and so forth;

- Technology transfer. Incoming firms are almost certain to have some competitive advantages that domestic firms will not have. It can be hoped that some of the technology that represents these competitive advantages will find its way into the domestic economy, either because understanding of it leaks out of the investing firm or because local firms are required to service it in some way. Not all form of technology will be suitable for transfer or yield their full value but some will;
- Industrial deepening: this represents the development of relationships between the investing firm and domestic firms. Local firms, many of which will be small and medium-sized enterprises (SMEs), might provide services such as maintenance, market research, public relations and so forth. Investing firms will wish to localise their supply chain for cost purposes but, also, because it gives the investors a better profile in the local community. Many opportunities might arise from such relationships.

One problem that GMS countries face when seeking to establish relationships with investing firms is the so-called 'missing middle.' That is, within the SME category (which varies by definition from country to country), the great majority of firms are small in size and are very often in the micro SME scale. Such very small firms are less likely to be able to offer goods and services to investing firms with the quality and reliability that international best practice has come to expect. Although it is possible that some providers of FDI might be willing to develop potential local partners, this should not be assumed.

Becoming part of a value chain is a significant part for a host economy and, although it is difficult, this can be achieved, usually as a result of market mechanisms but not always. Examples of where this has taken place include the following:

- Farmers in Thailand have worked with the multiple retail giant Tesco-Lotus so that their produce reaches the level that it can be placed in retail outlets and, also, incorporated in products such as ready meals which might then contribute to the export market (Poupon, 2013);
- Firms or entrepreneurs can work with local products to get them to achieve international standards of quality and so become suitable candidates for local and international retails outlets. This has been achieved by Inca Inchi nuts (Sacha Inchi), Doi Chaang coffee (Pendergrast, 2015) and various dairy products in Myanmar;
- Some firms have established linkages with their own branches across borders for different stages of production. Toyota, for example, operates the Thailand +1 strategy whereby some less advanced aspects of automobile construction (e.g. manufacturing and fitting car seat covers) may be conducted in lower labour cost neighbouring countries such as Cambodia or Vietnam, after which the final product is completed in one of the well-established Thai industrial estates;
- Opportunities exist for local companies providing logistics, catering, security and other activities which the investing firm might prefer to outsource;
- Some clusters of agricultural products have been organized with government assistance in Lao PDR and these have led to sales of organic rice and vegetables in the domestic market. It is also notable that a group of investors negotiated directly with producers of white charcoal (bintochan) and this is now exported to barbecue restaurants in Japan and Korea (cf. Southiseng, Vilaychur & Walsh, 2016).

These are examples of what farmers in Vietnam might look to become involved with regional value chains in due course. One first step that might be followed is to work with a farming cooperative or farmers' product group (FPG). The term FPG is preferable here because cooperatives have become associated with various unfortunate episodes in history. The FDP might be used to provide help and support to individual households and does so act as an intermediary when commercial interests come calling. There are some cases of farmers in Thailand who now have the confidence to deal with large-scale potential customers directly but such

confidence takes a while to obtain. An FPG of sufficient size can also act as a market participant through cooperation, which is the case with some organic rice growers in Lao PDR. In any case, they can act as a source of information and a means of communication.

The previous analysis yields the following propositions:

- Farmers with access to more information sources are more likely to be able to access good market opportunities;
- Farming households will work together to obtain information;
- There is a connection between information and market access.

The paper now continues with a description of the methodology employed.

Methodology

Research Strategy

Since models of market integration of rural areas and the adoption of new technologies already exist, it was determined that a quantitative methodology would be appropriate. The contribution to knowledge would reside principally in the fact that investigation of these issue had not yet taken place in Vietnam. This country was selected because there are significant differences in conditions in rural settings:

- Vietnam has had considerable attention from the government sector with targeted provision of resources and this has led to the effective elimination of the worst forms of food insecurity (Walsh, 2016);
- Vietnam has a long coast which contains many ports which can be used to export goods. It has a higher population and a better developed retail sector in which sales of agricultural goods can be made in the domestic sector. Vietnam is now connected to China via a branch of the North-South Economic Corridor (NSEC) and this represents another important market.

It was decided that these factors meant that comparison between the two countries would be instructive in this regard. To ensure a good level of consistency within the two samples, country researchers were asked to select two distinct locations and asked to try to ensure an even amount of male and female respondents. Demographic details of the sample achieved are provided in Table x below. Within each location, researchers used a combination of convenience and purposive sampling techniques in order to obtain the required overall sample. The total sample size was reached by balancing a high level of confidence in the results received with issues of time and budget. Overall, the sample size was 200 questionnaires.

In terms of questionnaire design, several sources were used. After reviewing the literature, a scale of technology adoption which had been successfully used in India was employed (Meera, Jhanmati & Rao, 2004). This scale was adjusted after the pilot test when a few of the items included were deleted as they were not relevant to the research site. In addition to this, questions were devised to try to capture the other information required. These questions were considered by the research team and refined accordingly. They are questions that have in very similar forms been used successfully in other projects involving research in the rural settings of the GMS previously (e.g. Walsh, 2015)).

Once the completed questionnaires were returned, they were coded and entered into PSPP. PSPP is a free, open-source statistical analysis package which almost replicates better known products such as SPSS but which does not require the high licensing fee. Open access software of this sort is much more appropriate for conducting research in the developing world and enables a more diverse range of voices to be heard than would be the case if such analysis is restricted (without using pirated software) to the large institutions that can afford it. It is possible to make the argument that this open-source software represents a form of democratisation of the research process.

Once the questionnaires were entered into PSPP, they were checked for accuracy and then various statistical techniques were used to obtain the findings presented in section four. The data will be made available on request and additional analysis may be conducted by interested researchers.

Research Issues

Previous research in rural areas of the GMS has indicated that various problems exist above and beyond the normal methodological issues related to quantitative research (e.g. Walsh, 2016). These include the following:

- Low levels of education and life experience mean that many respondents find it difficult to understand questions, particularly when unfamiliar vocabulary is being employed;
- Low educated women are often reluctant to participate in any form of research so there is a danger of non-response bias;
- Some respondents misunderstand the role of the interviewer and suspect they might really be government agencies of some sort in disguise. This persuades some people that if they are able to provide the 'correct' answers, they will receive some sort of reward (and, alternatively, they might be punished for providing the 'wrong' answers). Relations between government and people across the GMS have often been antagonistic and this too can have a negative effect on the accuracy of responses given;
- Local dialects and terminology can vary to the extent that phenomena such as insects or plant disease can be referred to by different names in different villages and, in some cases, the phenomena might not be documented at all. This interviewing with respect to technical issues particularly difficult;
- In some cases, village leaders wish to act as gatekeepers to the villagers and suitable access must be negotiated before interviewing can take place;
- Rural households are often located in difficult to traverse terrain and finding an appropriate sample may become time-consuming and expensive as a result.

In order to address these anticipated questions, the following strategies were adopted:

- The questionnaire was constructed using vocabulary that was as straightforward and general as possible. The country researchers are both fluent in English and were encouraged at several stages to identify and attempt to resolve any particular language issues;
- If necessary, the country researchers were prepared to spend additional time within communities so that the villagers could get to know them and become more comfortable with talking to them;
- Country researchers were provided with letters from Shinawatra University assuring respondents that the research was purely for academic purposes and they the personal details or responses provided would not be revealed to anyone in any way that would identify them individually. Respondents were, of course, informed that they were free to withdraw from the process at any stage. During questionnaire design, an option for answering 'don't know' was provided at a number of places which could be used if respondents felt the question was sensitive;
- The country researchers were asked to maintain a research diary, in which they could make notes about any aspect of the research process which they thought important. Observations from the research diaries have been incorporated into the main body of this report.

All of these precautions were taken in addition to the provision of a pilot test for the project. The country researchers used the draft questionnaire with a convenience sample of 10-20 potential respondents. The purpose of the pilot was to check that respondents would be able to understand and answer the questions, amid some concern expressed by country researchers concerning the ability of rural persons in their home countries to answer some particular questions. As a result of the pilot test, some changes were made to the questionnaire (which became subtly different in each country as a result). However, the extent of the changes required was less than the country researchers had expected and this perhaps is a further indication of the rate of change in rural areas in the issues under consideration.

Once changes were made to the agreement of the research group as a whole, the main survey took place. Field research took place in June and July of 2017. This was followed by report writing and, in due course, the production of this paper.

Research Limitations

Despite the precautions described above, it is apparent that there are research limitations accompanying this project and these may be stated as follows:

- Despite the efforts of the country researchers, it is impossible to discount the possibility of some non-response bias, particularly with respect to the less well-educated women and with ethnic minority people who do not speak the national

language or English to the extent that they could answer the questionnaire properly. When ethnic minority people were approached, it was assumed that they spoke the national language well enough that their responses would be valid. However, this cannot be guaranteed to be true;

- Vietnam is very varied in terms of geography, ethnicity and climate and it is possible that the size of the sample was not fully able to reflect that level of diversity;
- Agriculture is a very seasonal activity but it cannot be assumed that the same seasonality is experienced simultaneously in the two countries concerned. However, dates vary according to the type of rice farming concerned and farmers growing other crops would also have different dates of interest;
- Although steps have been taken to harmonize the language used on the questionnaires, studies which employ more than one language are always vulnerable to the charge that differences between the modes of expression employed have resulted in imperfect comparisons.

Any other limitations identified will be discussed in the conclusion.

Findings

A total of 200 questionnaires were completed in Vietnam, including 100 from Cam Lo in Quang Tri province and 100 from Hoa Vang in Da Nang province. Eighteen villages were used as research sites to promote heterogeneity in the sample and for necessity.

Demographic Characteristics

The gender figures show a preponderance of male respondents. This was less the case in Da Nang than in Quang Tri, perhaps because more males have migrated for work in the former case, leaving more women in household leadership positions. As will be seen below, it is common for there to be significant differences in the results based on the location of the research site and this is also shown in this result.

Table 1: Gender of the Sample in Vietnam; source: Original Research (n = 200; p = 0.001)**

%age	Quang Tri	Da Nang	Overall
Male	79.0	58.0	68.5
Female	21.0	42.0	31.5

Respondents were next asked for their age category, with the following results.

Table 2: Age Categories of the Sample in Vietnam; source: Original Research (n = 200; p = 0.040*)

%age	Quang Tri	Da Nang	Overall
Up to 30	6.0	4.0	5.0
31-40	10.0	21.0	15.5
41-50	24.0	25.0	24.5
51-60	45.0	41.0	43.0
61+	15.0	9.0	12.0

The age of the sample is higher than that of the population as a whole, which is again indicative of the greying of agriculture in the region generally, as younger people are more likely to migrate for work, either to elsewhere in the country or overseas.

Table 3: Education Level of the Sample in Vietnam; source: Original Research (n = 192; p = 0.000)**

%age	Quang Tri	Da Nang	Overall
Up to three years	4.0	2.2	3.1
4-6 years	23.2	10.8	17.2
7-9 years	39.4	24.7	32.3
10-12 years	33.3	62.4	47.4

In terms of education, it is again notable that there is a statistically significant difference between the two research sites, with much higher levels of education available in Da Nang compared to Quang Tri. Since education is a contributory factor to higher levels of labour migration, it is not surprising to see these results in the light of the gender distribution described above.

Respondents were next asked about the household size, with the following results.

Table 4: Household Size of the Sample in Vietnam; source: Original Research (n = 200; p = 0.000)**

%age	Quang Tri	Da Nang	Overall
Up to 2 members	3.0	6.0	4.5
3-5 members	71.0	57.0	64.0
6+ members	26.0	37.0	31.5

Household sizes appear to be larger overall in Da Nang than in Quang Tri, although it is not clear why this should be.

Respondents were next asked about the amount of land that they farm, with the following results (measured in hectares).

Table 5: Size of Farmed Land for the Sample in Vietnam; source: Original Research (n = 198; p = 0.000)**

%age	Quang Tri	Da Nang	Overall
Up to 2	0	9.0	4.5
2.01-5	0	24.0	12.1
5.01-10	13.3	27.0	20.2
10.01+	86.7	40.0	58.1

The difference between the two research sites is again noticeable here, with farmers in Quang Tri having significantly larger farms than those in Da Nang. It is possible that labour migration from Quang Tri is lower than it appears to be in Da Nang is in part because of better prospects from larger farms as much as issues such as better education in the latter area.

When asked whether they farmed other people's land in addition to their own, the following results were obtained.

Table 6: Education Level of the Sample in Vietnam; source: Original Research (n = 192; p = 0.149)**

%age	Quang Tri	Da Nang	Overall
Yes	6.0	2.0	4.0
No	94.0	98.0	96.0

The average amount of land for those who did farm other land was in the 10.1+ category.

When asked whether they had another occupation, 67.0% overall answered that they did, with 62.0% of respondents from Quang Tri saying this and 72.0% from Da Nang province (n = 200; p = 0.133).

Livestock Management

In terms of livestock, 71.5% of respondents overall answered that they kept some livestock, with 98.0% from Quang Tri saying this and only 45.0% from Da Nang agreeing (n = 200; p = 0.000**). This is again a significant difference between the two sites and shows important differences in farming practices between them and these, presumably, have impacts on household income and prospects.

Table 7: Livestock Ownership by the Sample in Vietnam; source: Original Research (n = 192; p = 0.149)**

%age saying 'yes'	QT	Mean	SD	DN	Mean	SD	O	Mean	SD
Chickens	98.0	70.4	65.4	33.0	15.5	9.2	65.5	56.6	61.5
Ducks	22.0	503.0	588.2	9.0	11.9	6.8	15.0	372.0	547.2
Pigs	73.0	6.8	23.2	20.0	4.5	3.8	46.5	6.3	20.6
Cattle	51.0	4.0	2.3	4.0	5.3	4.6	27.5	4.1	2.5
Buffaloes	12.0	3.1	1.3	1.0	2.0	-	6.5	3.0	1.3
Fish	8.0	4,125.0	2,799.9	0	-	-	4.0	4,125.0	2,799.9
Other	1.0	100.0	-	0	-	-	0.5	100.0	0

In addition to being more likely to own different kinds of livestock in Quang Tri compared to Da Nang, farmers there also owned a larger number of each type of animal investigated. The numbers of animals involved suggest that these are being raised for market. For example, the mean number of ducks in Quang Tri among those who have them is 503.0 and the number of fish 4,125.0. It is known that various projects in Vietnam have been aimed at introducing integrated production schemes at the household or community level aimed at promoting environmental sustainability as well as enhanced incomes for those involved. Fish are often involved in projects of this sort and are deliberately aimed at market transactions.

Respondents were next asked a series of questions about the sources of information consulted by respondents, with the following results.

Table 8: Sources of Information on Livestock Management and Rice Farming Used by the Sample in Vietnam; source: Original Research

%age saying 'yes'	QT1	DN1	O1	N	P	QT2	DN2	O2	N	P
Family	99.0	33.1	78.4	144	0.000**	99.0	32.0	65.5	200	0.000**
Friends/neighbours	98.0	28.9	76.4	144	0.000**	98.0	21.0	59.5	200	0.000**
Newspapers/magazines	1.0	37.8	12.5	144	0.000**	1.0	36.0	18.5	200	0.000**
Television	100	64.4	88.9	144	0.000**	99.0	85.0	92.0	200	0.000**
Radio	1.0	33.3	11.1	144	0.000**	1.0	25.0	13.0	200	0.000**
Government officers	27.3	88.9	46.5	144	0.000**	29.0	75.0	52.0	200	0.000**
NGO representatives	1.0	2.2	1.4	144	0.565	1.0	2.0	1.5	200	0.561
Cooperatives/FPGs	83.8	6.7	59.7	144	0.000**	88.0	4.0	46.0	200	0.000**
Internet	92.9	26.6	73.4	144	0.000**	93.0	36.0	64.5	200	0.000**
Other	0	90	9.0	10	-	0	24.0	12.0	200	-

These results are quite striking in showing the significant differences between respondents at the two sites. Quang Tri respondents are much more likely to consult their families, friends, neighbours and television in searching for information on both livestock management and rice farming. On the other hand, Da Nang respondents are much more likely to consult government officers and the radio, suggesting a closer relationship with the state and level of trust in it there. Cooperatives/FPGs and the internet are almost overwhelmingly more likely be consulted in Quang Tri in both categories. Respondents were next asked about the types of agricultural information for which they look, with the following results.

There is a long series of statistically significant results in this battery of questions and they nearly all indicate that respondents in Quang Tri are more likely to search for these types of information. It might be that respondents are more aware of the information that they might find, especially online or it might be that they perceive a greater need to search for the information, while the Da Nang respondents are more relaxed about this need. The former explanation seems more likely. Searching for information on weather forecasting is very high but so too are searching for information on seeds varieties and breeds, input prices, disease and land records, among other areas.

Connectivity Issues

The questionnaire next moved on to ask a series of questions about connectivity in various aspects. The first of these concerned the length of time for which respondents had enjoyed access to the internet, with the following results.

Table 9: Types of Agricultural Information Sought for on the Internet by the Sample in Vietnam; source: Original Research

%age saying 'yes'	Quang Tri	Da Nang	Overall	N	P
Marketing information	58.3	31.5	45.2	188	0.000**
Seed varieties and breeds	100	53.3	77.1	188	0.000**
Question and answer service	68.8	45.7	57.5	188	0.004**
Rural development programmes and subsidies	77.1	30.4	54.3	188	0.000**
Weather forecasting	96.9	88.0	92.6	188	0.021*
Latest best practices	97.9	13.0	56.4	188	0.000**
Post-harvest technology	21.9	5.4	13.8	188	0.001**
General agricultural news	59.4	51.1	55.3	188	0.336
Crop insurance	6.3	6.5	6.4	188	0.000**
Farm business and management information	17.7	3.3	10.6	188	0.000**
Input prices and availability	95.8	7.6	52.7	188	0.000**
Early warning and management of diseases and pests	94.8	42.4	69.2	188	0.000**
Dairying and marketing of milk and milk products	1.0	1.1	1.1	188	0.000**
Accounting and payment	3.1	1.1	2.1	188	0.000**
Soil testing and soil sampling information	24.9	2.2	13.3	188	0.000**
Access to land records	97.9	28.3	63.3	188	0.000**

Table 10: Longevity of Internet Usage by the Sample in Vietnam; source: Original Research (n = 187; p = 0.411)

%age	Quang Tri	Da Nang	Overall
Up to one year	0	2.2	1.1
1-2 years	24.2	25.0	24.6
3-5 years	64.2	57.6	61.0
5+ years	11.6	15.2	13.4

Most of the respondents, it is clear, have had access to the internet for more than three years. This is in accordance with various reports describing penetration of Vietnam by mobile telephones and the internet mentioned above. It is clear that more of the respondents in Vietnam had access to online services and for longer than the Myanmar respondents.

The next question concerned the frequency with which respondents used online services, with the following results.

Table 11: Regularity of Access to the Internet by the Sample in Vietnam; source: Original Research (n = 187; p = 0.000)**

%age	Quang Tri	Da Nang	Overall
Daily	36.8	60.9	48.7
Weekly	57.9	21.7	40.1
2-3 times a month	4.2	12.0	8.0
Monthly	1.1	5.4	3.2

In this case, it is evident that there are significant differences between internet usage in Quang Tri and Da Nang. Respondents in the latter access the internet much more frequently than respondents of the former do. As will be seen below, this might be a cost-related issue. Instead, it might be related to education with respect to what is available online. The following results shed more light on this subject.

Table 12: Reasons for Using the Internet by the Sample in Myanmar; source: Original Research

%age saying 'yes'	Quang Tri	Da Nang	Overall	N	P
Ease of access	41.1	72.8	56.7	187	0.000**
Availability of relevant content	96.8	37.0	67.4	187	0.000**
Quality of information	10.5	15.2	12.8	187	0.338
Cost of obtaining information	6.3	43.5	24.6	187	0.000**

In three of the four questions involved here, there are statistically significant differences between the two research sites here. Da Nang respondents are much more likely to think that ease of access and cost of obtaining information are important reasons for using the internet, which suggests that internet access is more convenient there than in the Quang Tri sites. On the other hand, in Quang Tri it is the availability of relevant content that is more important, which suggests a possibility that education in what is available there might be fruitful (since Da Nang respondents, with more access, do not find this to be so much of an issue).

Respondents were next asked about the potential benefits of the access to the internet in terms of their own household, with the results obtained as follows.

These results demonstrate, again, significant differences between the two research sites. The Da Nang respondents clearly feel much more strongly than the Quang Tri respondents that the internet brings them opportunities for better education and better entertainment. Meanwhile, Quang Tri respondents are much more likely to feel that internet access contributes to better agricultural outputs and income and that family prospects will be improved. These results suggest that one set of respondents have a better and more experienced understanding of what the internet can provide than the other and, since Da Nang respondents have had, it seems, easier and more copious experience of internet services, it is reasonable to assume that it is they who have the more mature understanding of the situation. Consequently, it is reasonable to assume that respondents currently think that internet access is more related to education and entertainment than development opportunities.

Contract Farming

The questionnaire concluded with a few questions about contract farming, on the basis that contract farming is an activity that, while far from perfect in guaranteeing equitable distribution of profits, nevertheless provides opportunities for income generation that can be worthwhile. The results concerning whether contract farming is taking place now or has done in the place brought the following results.

It is evident that contract farming is much more prevalent in Da Nang than Quang Tri, which again suggests that the former has a higher level of economic connectivity than the latter.

When asked about their level of satisfaction with contract farming, 84.6% of Quang Tri respondents were satisfied and 15.4% neither satisfied nor dissatisfied (n = 13), while in Da Nang, 2.3% were very satisfied, 62.8% satisfied, 32.6% neither satisfied nor dissatisfied and 2.3% dissatisfied (n = 43). This was not a statistically significant result.

Conclusion

The results for the Vietnam research are similar in that there are consistent and evident differences between the two research sites. This indicates that there are real and important differences within the two countries in which research has taken place, as well as differences between the two countries. This indicates the importance of the roles that might be played by local government agencies, agricultural extension services, NGOS, cooperatives and FPGs and, also, private sector organizations in extending knowledge and experience with what might be achieved through access to online services and related issues.

Table 13: Possible Benefits from Using the Internet by the Sample in Myanmar; source: Original Research

%age saying 'yes'	Quang Tri	Da Nang	Overall	N	P
Agricultural outputs and income improved	48.4	7.6	28.3	187	0.000**
Family's income/livelihood improved	48.4	16.3	32.6	187	0.000**
Better education	44.2	81.5	62.6	187	0.000**
Better entertainment	2.1	45.7	23.5	187	0.000**

Table 14: Experience of Contract Farming in the Sample in Vietnam; source: Original Research (n = 187; p = 0.411)

%age	Quang Tri	Da Nang	Overall
Have you ever done contract farming?	5.1	42.0	23.7
Are you doing contract farming now?	4.1	23.0	13.6

Discussion

This research project aimed to determine whether a hypothesised link between take-up of mobile telecommunications and the internet could be linked to greater engagement with regional, national and international markets and, hence, with better household prospects in terms of income and opportunities. It has been found that this is taking place to a certain extent but not on a consistent or wholly coherent basis. It is evident that there are numerous statistically significant distributions with respect to the two research sites in each country. This suggests that no single strategy would be successful in promoting the goals of greater information and market access. However, the variations in the use and nature of information are such as to suggest that interventions in specific places and for specific purposes might be useful. These interventions might be made by government sector agricultural extension service personnel or by representatives of NGOs. Community education might also prove beneficial.

As part of its attempts to reduce the vulnerability of rural regions to global climate change effects, the Vietnamese government has been encouraging the spread of 'climate smart' agricultural systems which aim to ensure that integrated systems make the best use of resources on a sustainable basis. For example, there are gender-aware aquaculture systems combining tilapia, tiger shrimps, sea crabs and seaweed and the campaign for 'growing grass, raising cows, earthworms, pigs, fish, chickens, ducks, and growing vegetables' (Tung & Tuan, 2016). In Vietnam, a number of respondents who kept pigs had only one or perhaps two, indicating that they were being kept for special occasions. Keeping fish is a comparatively recent phenomenon for farmers in the Mekong region and one which is tied to sale to a market system. The keeping of ducks is also associated with market-based activities. These activities might be spread further across the region.

The length of time that people have had access to the internet remains quite limited and it is evident that people will learn more about the information that is available and the way that access can bring benefits to them. To some extent, this will be a self-organizing practice as people learn and share their discoveries with their friends and family members. However, again, there are opportunities for interventions to be helpful.

The research method employed has obtained the information required but it has certainly been notable that some problems have been encountered along the way in trying to achieve a balanced research sample, compared to the overall population. In part, this is because of the twin dynamics of labour migration and the greying of agriculture in rural areas and, in part, it is because of the reluctance with which some women approached the idea of providing their own opinions. Extra efforts are needed to ensure that samples achieved are as heterogeneous as possible. To this difficulty may be added the additional problems of time and money in that researchers are required to reach often remote villages that form part of the survey and obtain necessary permissions to proceed. Dialect and suspicion are also barriers that may have to be overcome. These are additional challenges which help research stimulate learning.

Conclusion

This report has considered a research project that was aimed at exploring the role of mobile telecommunications and the internet in enhancing household income in rural households in different sites in Vietnam. A quantitative research approach was adopted and a total of 200 completed questionnaires were collected. The research project was successful in investigating the research questions and some partial support for the original hypotheses was found.

This research is, by design, limited in both time and space. It has also suffered from the issues explained in the methodology section that have made it more difficult to obtain a sample that resembles closely the population. As a result, it would need more research to be sure about the results that might be obtained from other regions of the countries surveyed. In particular, ethnic minority people who do not speak the national language as a first language were not included in the research and there are comparatively large numbers of people in this category.

Longitudinal research would be helpful in determining whether strategies formulated on the basis of this research and similar studies will prove to be successful in the future. It would also be helpful to extend the research to other parts of the Mekong region.

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