Appendix 8.2

This case study forms part of the overarching
2017–19 ACIAR Mango Agribusiness Research Program

Project:	**Supporting access to mango research information, communication, collaboration and capacity development**
Study:	**Online and social media**
Project number:	**AGB/2016/006**
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1   Acknowledgements

2   Introduction

2.1   Project background

Over the last 35 years, ACIAR has supported a number of mango-related projects that have had significant impact for the industry in the Asia-Pacific region. This project examined how these impacts could be further amplified with a strategic-planning approach that takes a stronger focus on communication and collaboration between partner countries and Australia. The project looked at how linkages could be formed using communication tools to bring alignment and engagement to the Mango Agribusiness Research Program.

2.2   Study objectives

The aim of the study was test whether a best-practice communication method –either web-based or online – connect mango researchers to then form an exchange or partnership across two sectors: public institutes and private organisations.

Specifically, the study sought to identify methods of improving information access and communication in order to facilitate the exchange of learnings between project partners.

2.3   Study methodology

Feedback and insights to inform this study were collected using an online questionnaire to capture researchers engaged with the website, www.apmangonet.org, and the FaceBook social media group page throughout the Mango Agribusiness Research Program project period.

3   Results and discussion

3.1   Background

Effective research partnerships require a shared understanding of the issues and a shared respect for the knowledge and capability of each partner. This project sought to assess whether digital technology can support productive relationships between researchers seeking to address unresolved questions and improvement opportunities in the mango production and trading industries. The approach proposed a structured series of activities to test and evaluate the use of digital tools in building and maintaining researcher relationships, and to attempt to understand the relevance of new technology platforms to mango research programs.

Using a consultative approach, the study developed a publicly accessible website and a group page on the social media platform Facebook to share the learnings and outputs from across the mango agribusiness studies, supporting the ACIAR Mango Agribusiness Research Program and the wider mango research community. The communications strategy directly engaged partner country researchers and specialists, their institutions and the Australian mango industry (AMIA).

3.2 Website focus

Asia Pacific Mango Network website – apmangonet.org

Planning and development

The initial planning of the website was undertaken in August 2017, through a consultation process with the Mango Agribusiness Research Program lead investigators. This contributed to concept development and provided inputs into the website design and the approach used by researcher to share outputs on the site.

Initially, the proposed budget was unable to be met by contractors and, in order to proceed, a revised version of the site was developed that had less content. A contractor was engaged to design, build and launch the website based on the revised version. A reference group was formed, content was identified and collated to build and test the website, and steps were taken to refine and enhance systems for evaluating stakeholder usage and preparing user engagement reports.

User engagement

The total number of page views, unique page views and users fluctuated in 2018 and increased significantly 2019, especially in March and April 2019 (see Supporting documents section, Figures 1 and 2). Among individual pages of the website, the home page and research page received most views (See Appendix 1 Figure 3). Almost every increase in page views and number of users occurred after project events. For example, there was a workshop in the Philippines in July 2018, and an official project launch event and a workshop in Vietnam in September 2018, which may have resulted in the increased number of page views and users in August and October in 2018. Similarly, the considerable growth in page views and users in 2019 could be explained by the final workshop held in China in March 2019. Most likely, these events increased the awareness and interest in both the Facebook group page and the apmangonet website, and vice versa. This is a good example of bridging the online and offline interactive platforms.

The average time spent on-page was approximately two minutes; this indicates that the website acts a general information portal for mango researchers instead of a place for content co-creation. It is our intention that the website become a platform for strengthening the online presence and awareness of the Asia Pacific Mango Network while the social media provides the mechanisms for interactions and communications among mango researchers. The bounce rate of the website increased from about 50% in 2018 to 60–70% in 2019. Using Website Grader, a tool for evaluating the technical performance of a website, in May 2019 the page size was found to be 3.3 MB average page size and page loading speed was 8.2 seconds. Similarly, although the website was optimised for mobile devices using responsive design and viewport, Test My Site, an application by Google, showed that the mobile page loading speed was 6.4 seconds. These results indicate some room for improvement, as the optimal page size is 3 MB or less and the loading speed should be no more than 3 seconds. This could contribute to the high bounce rate as visitors might not be patient to wait for the page to finish loading.

In 2019, most visitors of the website were using English (US, UK, Australia and New Zealand), Vietnamese, Korean, Chinese (simplified) and Japanese. Direct visitors – those who have navigated to the site by typing the URL into the address bar in their browser – and organic search visitors – those who arrived to the website based on a search query entered into a search engine – constituted the majority of website traffic (Appendix 1 Figure 3). Only a few visitors were referred from social media and other channels. This demonstrates that most visitors actively look for the website and that the number of visitors has grown organically, which implies a positive trend in the organic search ranking of the website; however, it also suggests there is greater opportunity for linking the website to other communication channels such as relevant websites, email marketing and

social media. This could also help to further improve the search engine optimisation of the website.

3.3   Social media focus

Facebook development stages

The development of the Asia Pacific Mango Nework Facebook page can be divided into three stages: Stage 1, from March 2018, when the page was first created, to July 2018; Stage 2, from August 2018 to December 2018; and Stage 3 from January 2019 to May 2019.

Stage 1. A large amount of time in Stage 1 was dedicated to setting up the Facebook page and identifying an effective communications approach for agricultural researchers, given this was the first social media platform connecting mango researchers in the Asia-Pacific region. Efforts were made to understand the target audience and to create content that was relevant and useful for it. This was the most challenging stage, as it required developing an initial awareness and then engaging agriculture researchers with the Facebook page. Although the number of likes and followers only slowly increased, reaching 39 likes, 44 followers, 6,022 impressions and 490 engagement on 31 July 2018, the page became known among a small group of researchers and the project team started to develop an understanding of the audience and the content that could attract attention.

Stage 2. Stage 2 was characterised by its exploratory nature. The project team used a number of different categories of information such as mango produce news, researcher profiles and research events to diversify the content and connect with the audience. Various post formats were used, ranging from links only to description and link, description and image, and a combination of description, image and link. Figure 1 in Appendix 2 demonstrates the success of different post types based on average reach and engagement. In general, posts with photos had better reach, post clicks and engagement (i.e. reactions, comments and shares). This informed the decision to include more images in posts during this stage. The page also linked to other activities within Asia Pacific Mango Network in this stage, for example by including information about workshops and researchers, in order to provide the target audience with more information and attract them to the platform. These activities resulted in a 65.1% increase in total page likes, total a 73.9% increase in total impressions, and a 33.9% increase in total engagement. By 31 December 2018, the page had 71 likes, 77 followers, 10,474 post impressions and 656 post engagements. Moreover, these activities revealed a great deal about the audience, such as their preferences and demographics.

Stage 3. Stage 3 was characterised by active and dynamic engagement, including trialling and testing new approaches. During Stage 2, it was apparent that most users tended to passively receive information via the page's posts; only a few researchers made their own posts. The Asia Pacific Mango Network page was playing an important role as a community hub to connect researchers and disseminate information; however, because it was mostly centrally managed, researchers may have found it difficult to interact with the others. Therefore, on 24 January 2019, the project team created a Facebook group that was attached to the existing Asia Pacific Mango Network page. This Facebook group acted as two-way communications platform for individual researchers. Current fans and followers of the Asia Pacific Mango Network page were prompted to join the group and were encouraged to share information.

In order to increase the level of interactive among group members, the project team organised a Facebook competition targeting participants of a workshop in China in March 2019. The participants took part in the contest via four steps:

- STEP 1: Like the Asia Pacific Mango Network page (https://www.facebook.com/APMangonet/).

- STEP 2: Join the Asia Pacific Mango Network group (https://www.facebook.com/groups/1154871758004822/?source_id=206698639884129).
- STEP 3: In the Asia Pacific Mango Network group, post a maximum of 150 words about the most interesting aspect of your research and a relevant picture; for example, a unique research design, a memorable experience during data collection, a special technology used in data analysis, or an unexpected finding.
- STEP 4: Encourage others to like their post. They can also like other participants' posts.

The main purpose of this event was to promote to facilitate the exchange of learnings between mango researchers. The results were very positive. More than 70 members either shared their research aspects or supported other researchers through their reactions (for example, like or love in response to a post) and comments. This resulted in 44 new page likes and 45 new followers in March 2019 alone. By the end of May 2019, the page had 134 likes, 143 followers, 11,108 post impressions and 438 post engagements. The reduction in engagement on the page could be explained by the fact that a lot of activity took place in the Facebook group, potentially dividing the engagement level between group and page. This is a common situation in Facebook pages because of changes to the site's algorithms in 2019, which prioritise personalisation and close relationships (Facebook, 2019). However, given the main purpose of the use of social media in this project was to act as a mechanism to enhance communication and interaction between researchers across mango research activities with stakeholders, increasing interaction and engagement in the Facebook group was consistent with the desired outcome.

Audience profile

Approximately 40% of fans and followers of the Asia Pacific Mango Network Facebook page are female, while the total reach encompasses a relatively even split between males and females. The majority of female fans and followers are 25–54 years of age, whereas for men this is 18–44. However, the age group that the page is most able to reach is 25–34. These figures (see Appendix 2 Figures 2, 3 and 4) reflect a wide demographic that interacts with the page. The audience shows a similar level of activity across both week days and weekends, and is more likely to be active before 9 am and after 6 pm on a typical day. Fans and followers of the Facebook page predominantly come from Pakistan, Australia, Vietnam, China, the Philippines, Indonesia and Laos. In addition, the most reach the page has is with people in Vietnam, Australia, the US, Pakistan, Indonesia, India, Sweden, China and Germany.

Overall performance

Regarding the Asia Pacific Mango Network Facebook page performance*,* as of 31 May 2019, there were 134 page likes, 143 followers, 11,108 post impressions and 438 post engagements (these statistics were obtained from Sprout Social). The Like Rank of the page is 72/100, which is determined based on page practices such as settings, post characteristics and design, and page performance measures such as number of likes, engagements and mentions. This placed the page in the top 9% for all countries and categories. Furthermore, Asia Pacific Mango Network Facebook group has a total 12 posts, 17 comments and 160 reactions. While a lot of activity in the group centred around the competition event in March, a number of interactions also occurred after the event. The group has 105 members, 44 of whom are considered active members. They tend to be most active on Friday. This information provides good insights for our engagement strategy.

In order to understand the experience of mango researchers with social networking sites in relation to research networking, and with the Asia Pacific Mango Network (APMN) Facebook page and group, an online survey was carried out from May to June 2019.

Forty-two mango researchers from the data base were emailed with an invitation to participate in the research study, and a link to the survey was also posted on the Asia Pacific Mango Network Facebook page and in the Facebook group, in which majority of the audience were mango researchers. There were 19 respondents (46.2% male and 53.8% female), whose ages ranged from 21 to 72, though the majority were between late 20s and early 40s. The respondents were from Australia (38.9%), China (11.1%), Vietnam (11.1%), the Philippines (5.6%), Pakistan (5.6%) and Fiji (5.6%).

Most respondents had an active Facebook account. Approximately 60% of the respondents selected Facebook as the social networking site that they used most often, followed by WeChat (30%), LinkedIn (6.25%) and Instagram (6.25%); however, respondents expressed differing opinions regarding the most suitable platform for research networking: 36.84% selected Facebook; 31.58% selected LinkedIn; and the rest were equally distributed between Twitter, Instagram and WeChat.

To collect information regarding researchers' perceptions and experiences of using social media and Facebook (page and group) for research networking, 7-point Likert scale questions were used (with 1 indicating 'strongly disagree' and 7 indicating 'strongly agree'). Respondents indicated that it was easy to share knowledge and information (mean: 5.15; standard deviation: 1.35) as well as interact with other researchers on a Facebook page (mean: 5.08; standard deviation: 1.43). However, only 53.84% of respondents agreed to some extent that it is easy to obtain knowledge and information from a Facebook page. This could be attributed to the fact the Facebook, along with other social networking sites, is facing challenges in managing the reliability and authenticity of information and in dealing with fake news (Ireton & Posetti, 2018). This presents an obstacle to using social media for information and knowledge dissemination, which the project team attempted to address by linking our communications channels (i.e. agpmangonet.org and Facebook page) on the website and selecting information from genuine research projects and reliable sources.

All of the respondents (except one) were members of APMN Facebook group, and only two had not visited the Facebook page. Sixty percent of respondents revealed that the main purpose for using the Asia Pacific Mango Network Facebook page was to get information and updates on agribusiness; other reasons included finding opportunities for research collaboration (17.24%) and interacting with other researchers (10.34%). In general, respondents expressed positive attitudes towards the APMN Facebook page in terms of the agricultural knowledge it provided (mean: 5.27; standard deviation: 0.75) and how it facilitated interaction with other researchers (mean: 5.45; standard deviation: 0.79). Furthermore, they indicated their willingness to share information, comment and interact with other users in the APMN Facebook page and group (all means were greater than 4.5). This is demonstrated in Figure 1 (Perception and behaviour regarding APMN Facebook Page) and Figure 2 (Perception and behaviour regarding APMN Facebook Group) in Appendix 3.

The survey also provided some insights into social media usage that could be used to engage more users on the Facebook page and group. In particular, the time that respondents are most active in social networking sites was between 7 pm to 10 pm (35%), followed by 4 pm to 7 pm (17.39%) and 10 am to 1 pm (17.39%). The respondents also provided some feedback on how to improve the APMN Facebook page and group. One suggested to use a few different formats of communications such as PowerPoint. Another recommended posting more detailed, relevant local information, such as about ACIAR researchers and research studies, and less generic content from websites such as Fresh Plaza.

Overall, the results confirm that Facebook is one of the most suitable platforms for research networking. Although respondents suggested alternatives such as LinkedIn and WeChat, there are some inherent limitations in using these platforms. For example, the respondents were not as active on LinkedIn as they were on Facebook, and WeChat is

more popular among Chinese researchers and might not be used by many researchers from other countries. According to the We Are Social *Global Digital Report 2019*, Facebook topped the rankings for number of active user accounts, followed by YouTube, WhatsApp, and Facebook Messenger. This is supported by the findings of a global survey conducted by Hootsuite on how and why organisations around the world use social media; the survey revealed that Facebook, Twitter and Instagram were the most used social networks across all regions. In particular, Facebook still dominates in organisations of all types and sizes (Hootsuite, 2018). Nevertheless, the potential exists to use multiple platforms to engage audiences, especially those from countries where the social media access has been restricted – especially in China (excluding Hong Kong, Macau and Taiwan), where Facebook, Instagram and Twitter are actively blocked by the government, and are accessible only by using virtual private networks.

4 Conclusion and recommendations

4.1 Conclusion

The development and implementation of digital tools for this project demonstrates that digital media can be a great tool for developing researchers' networks. The Asia Pacific Mango Network website, Facebook page and Facebook group are in their early stages, and different activities and formats have been tested. Specific metrics have been used to evaluate the capacity of the website and Facebook page/group to bring the mango research community together. Although there are limitations to the website's function, it has played an important role as a general information portal for mango researchers in the Asia-Pacific region. Engagement with Facebook increased over time through improvements to features such as post format (e.g. from pure links to images and texts) and through the introduction of a group event.

There have been a number of challenges in developing and implementing these digital tools. Time constraint is a major factor: a networking page often takes a long time to grow its fan base and enhance engagement. For example, Growcom Australia, a peak representative body for Queensland horticulture that consists of Queensland's fruit and vegetable producers as well as individuals, groups and industries who have a stake or interest in the future of Queensland horticulture, took 10 years to gain 3,342 page likes (Growcom Australia, 2019). With regard to the APMN Facebook page, the target audience (mango researchers) is even more niche and timely.

Furthermore, the APMN Facebook page and website rely on organic growth without any advertising expenditure. In recent years, it has become tougher to increase organic reach due to the competitive space being shared with greater amounts of paid content (Dane, 2018). As such, an opportunity for further strategic exploration exists with cross-channel promotions such as search ads. Finally, because the APMN target audience comprises various countries in the Asia-Pacific region, the preferred communications platforms by each country, could be variable as was confirmed in this project's survey findings. For example, because the Chinese government has blocked Facebook and many other social media platforms, researchers in China are more likely to prefer using their locally developed social media, such as WeChat. Although the audience profile in the previous section shows the geographic diversity of the APMN Facebook fans and followers, the platforms could still be optimised to enable communications and engagement among mango researchers in Asia-Pacific region.

4.2   Recommendations

Based on the results of the website and Facebook page performance, and on consideration of challenges in the current project, further steps should be taken to link online channels – for instance, adding a Facebook newsfeed widget to the website and using email marketing – in order to increase cross-channel interaction and experience. All online channels should be consistently monitored and updated with relevant and useful content, especially specific information such as research insight from mango researchers in the Asia-Pacific region.

To facilitate research information exchange and communications, it is recommended to test incorporating a blog space on the website that features on the homem page, to which researchers can contribute by EOI or invitation. This could improve information access and provide a space for mango researchers to communicate their research to a wider audience, and would help to overcome the limitation of restricted access to social media in certain countries. The technical performance of the website could also be improved by reducing the page size and loading time for both desktop and mobile versions.

Regarding social media, the Facebook page could be optimized by learning which hashtags and phrases to use in the social media posts in order to increase the chance of being found when people search for content relevant to the Asia Pacific Mango Network. Furthermore, influencers can play a significant role in user engagement in social media, and it is therefore recommended to invite some influential researchers to endorse the Facebook page and interact with other researchers in the Facebook page and group. The use of live videos with these key influencers could be particularly effective in increasing page reach and page engagement because Facebook algorithms prioritise content with native videos (Reyes, 2019). In addition, creating affiliations with other relevant organisations that have an online presence, such as Aussie Mangoes, Horticulture Innovation Australia Limited (which has almost 80,000 followers and fans) (Aussie Mangoes, 2019), would help increase awareness of Asia Pacific Mango Network among mango researchers.

5   References

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6   Supporting documents

6.1   Website metrics

Page view

Figure 1: Page views and unique page views for APMN website from April 2018 to May 2019
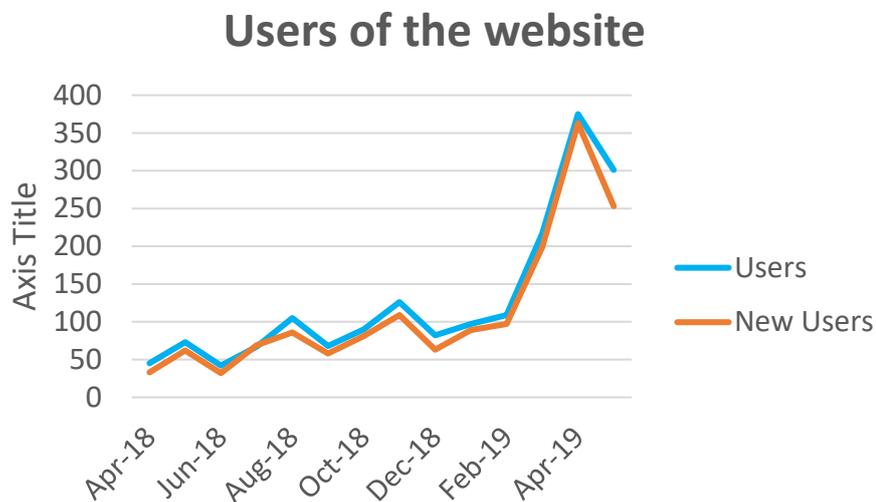
Users of the website

Figure 2: Users and new users of APMN website from April 2018 to May 2019
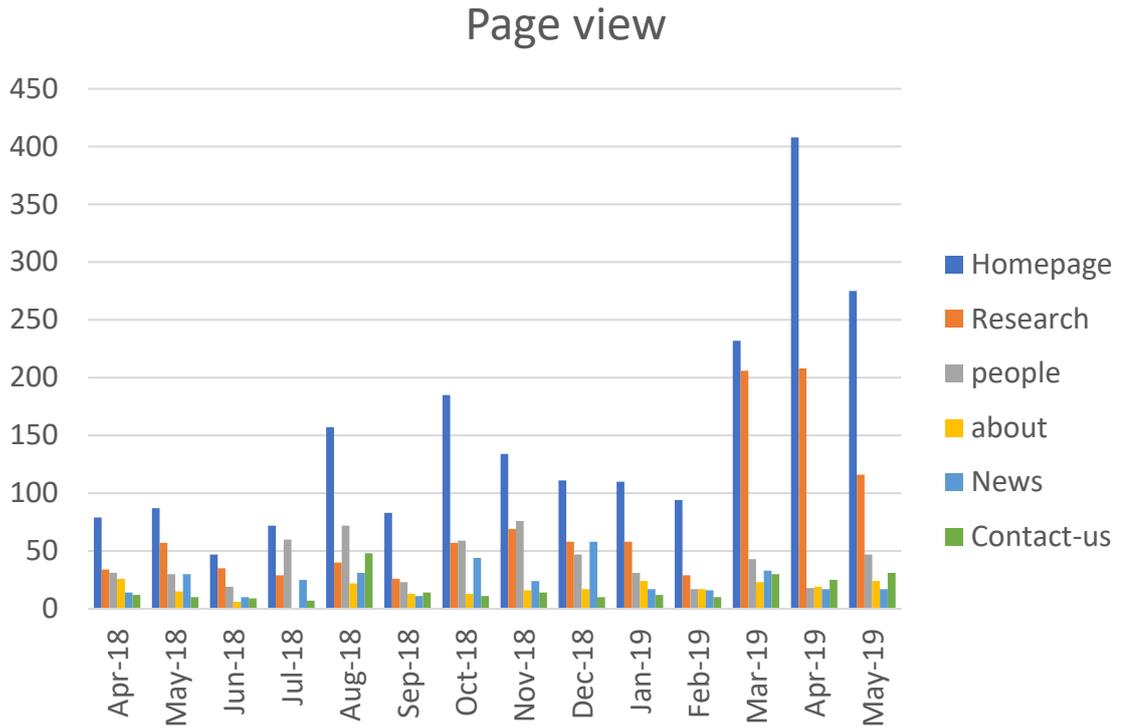
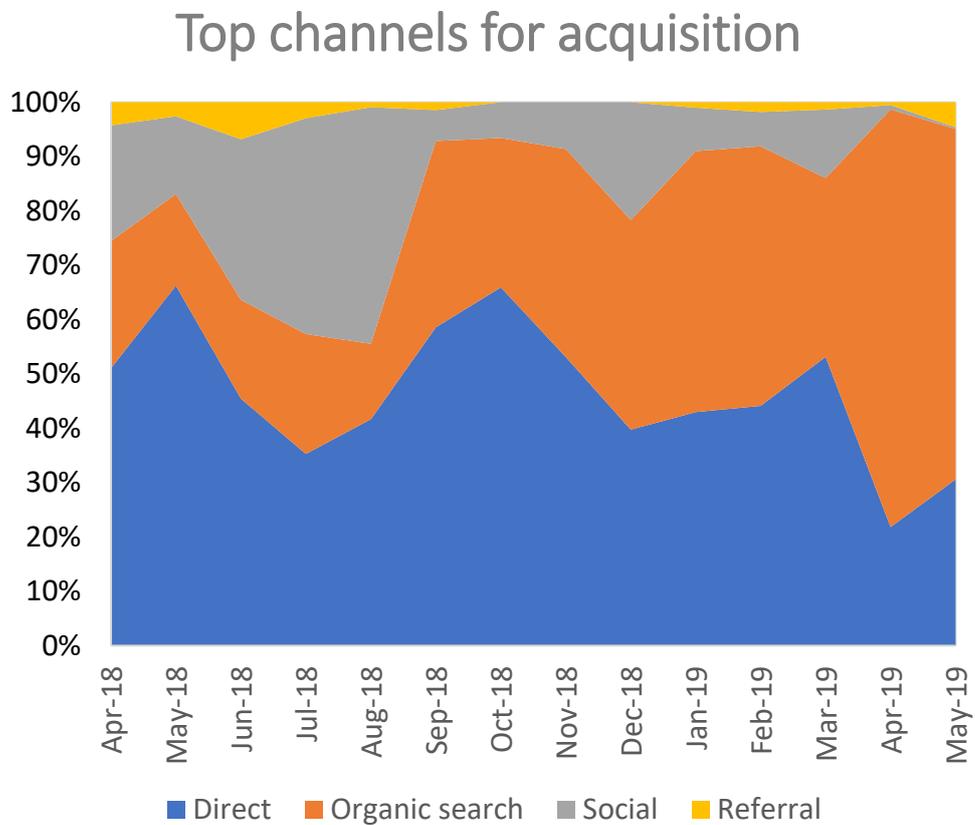Figure 3: Page views for individual pages of APMN website from April 2018 to May 2019

Figure 3: Top channels for acquisition.
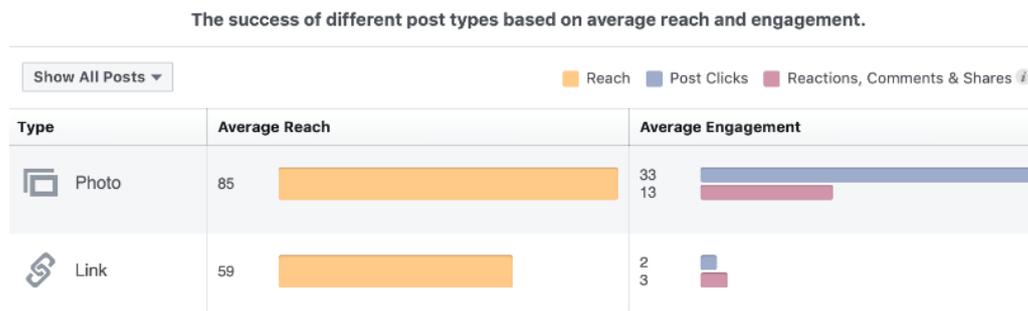
6.2 Facebook metrics

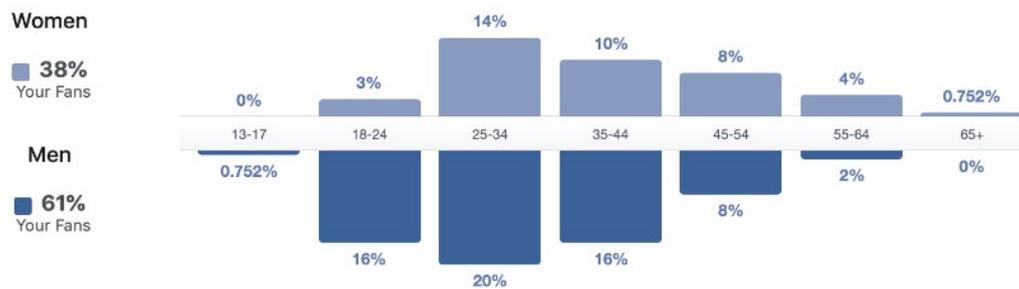The success of different post types based on average reach and engagement.

Type	Average Reach		Average Engagement	
📷 Photo	85		33 13	
🔗 Link	59		2 3	

Show All Posts ▾   Reach   Post Clicks   Reactions, Comments & Shares ℹ

Figure 1: The success of different post types based on average reach and engagement (Facebook, 2019)

Women
■ 38%
Your Fans

Men
■ 61%
Your Fans

	13-17	18-24	25-34	35-44	45-54	55-64	65+
Women	0%	3%	14%	10%	8%	4%	0.752%
Men	0.752%	16%	20%	16%	8%	2%	0%

Figure 2: Age and gender of people who like the Asia Pacific Mango Network Page

Women
■ 38%
Your Followers

Men
■ 61%
Your Followers

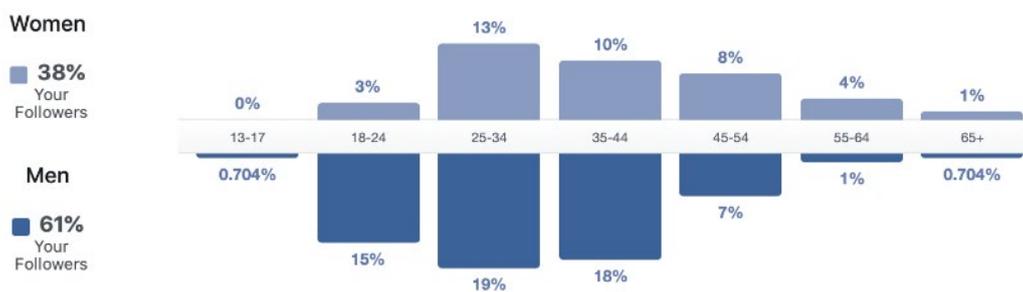|	13-17	18-24	25-34	35-44	45-54	55-64	65+
Women	0%	3%	13%	10%	8%	4%	1%
Men	0.704%	15%	19%	18%	7%	1%	0.704%

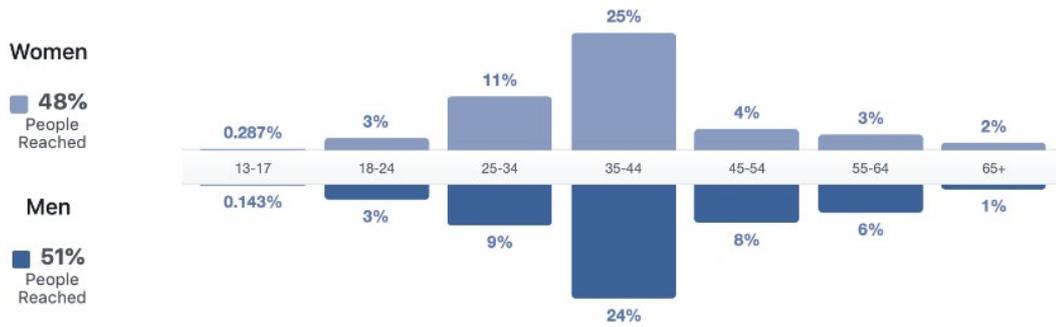Figure 3: Age and gender of people who follow the Asia Pacific Mango Network Page

Figure 4: Age and gender of people who had any content from the Asia Pacific Mango Network Page or about the Asia Pacific Mango Network Page enter their screen
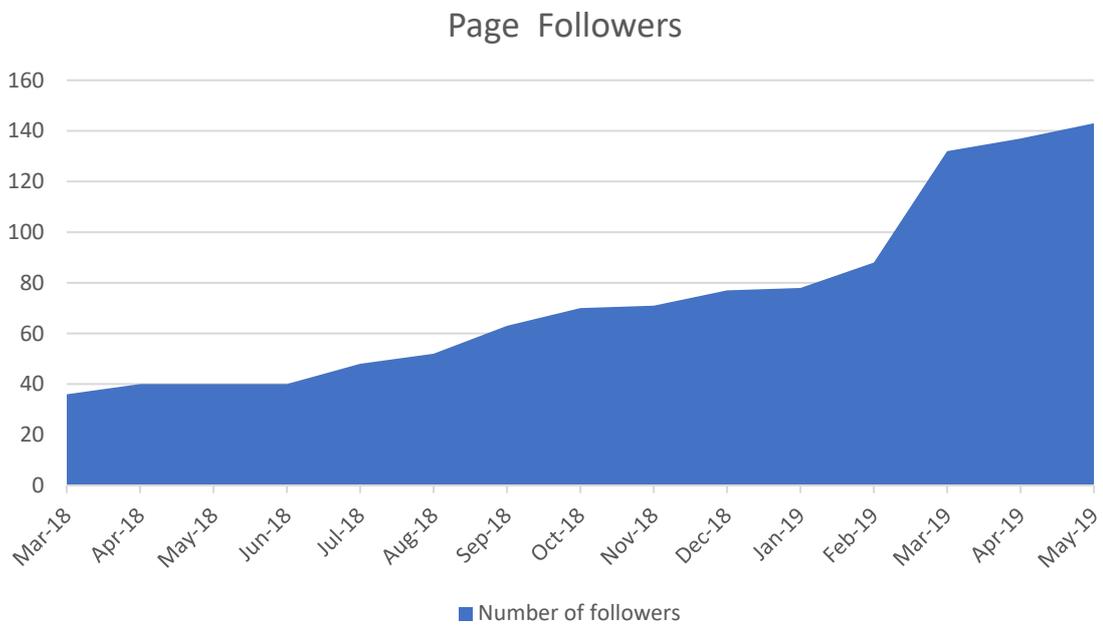

Figure 5: Number of Asia Pacific Mango Network Page Followers (from 26 March 2018 to 31 May 2019)
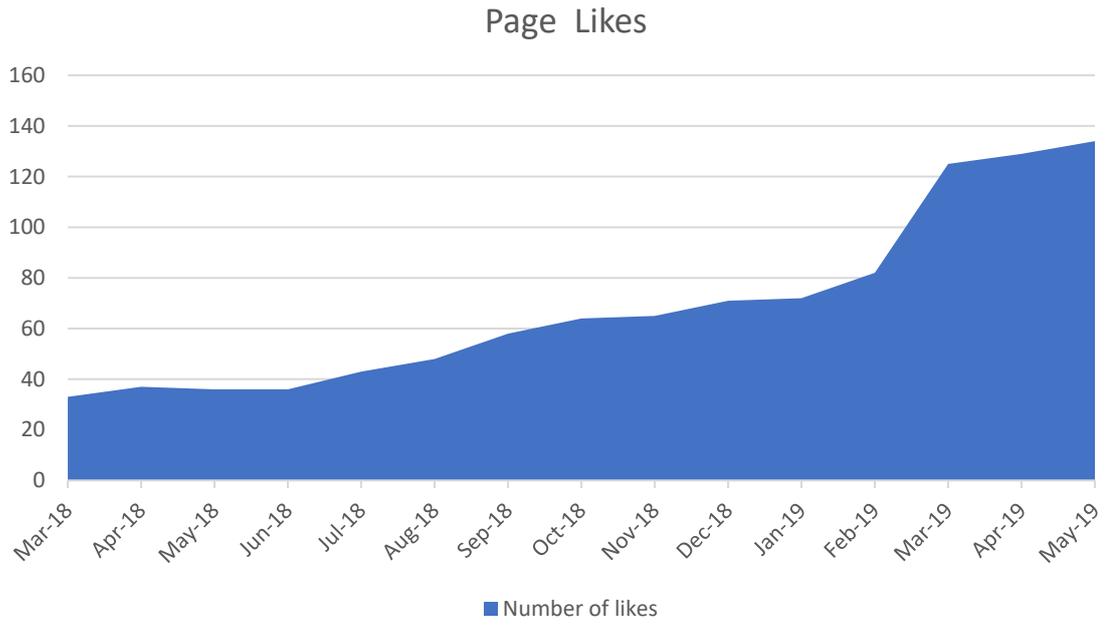
Page Likes

Figure 6: Number of Asia Pacific Mango Network Page Likes (from 26 March 2018 to 31 May 2019)
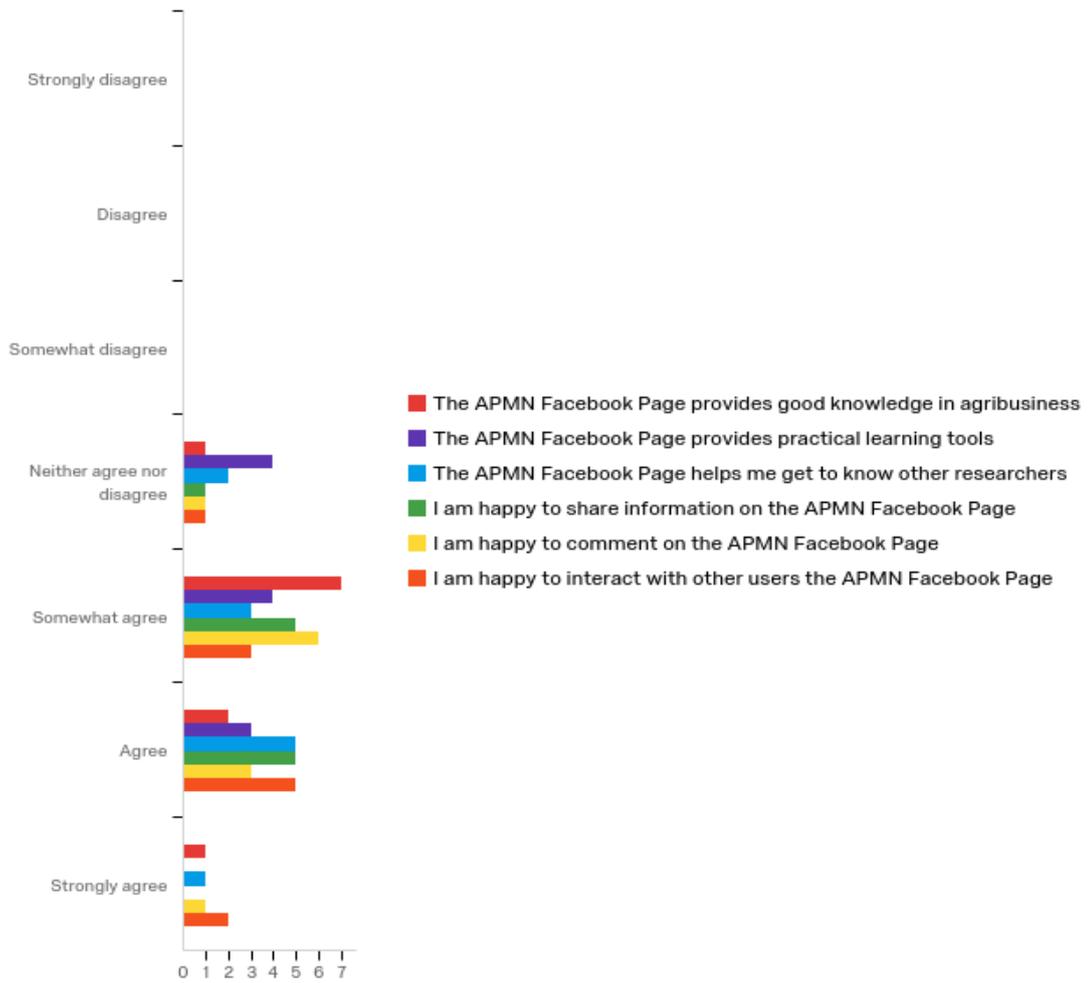
6.3   Survey findings

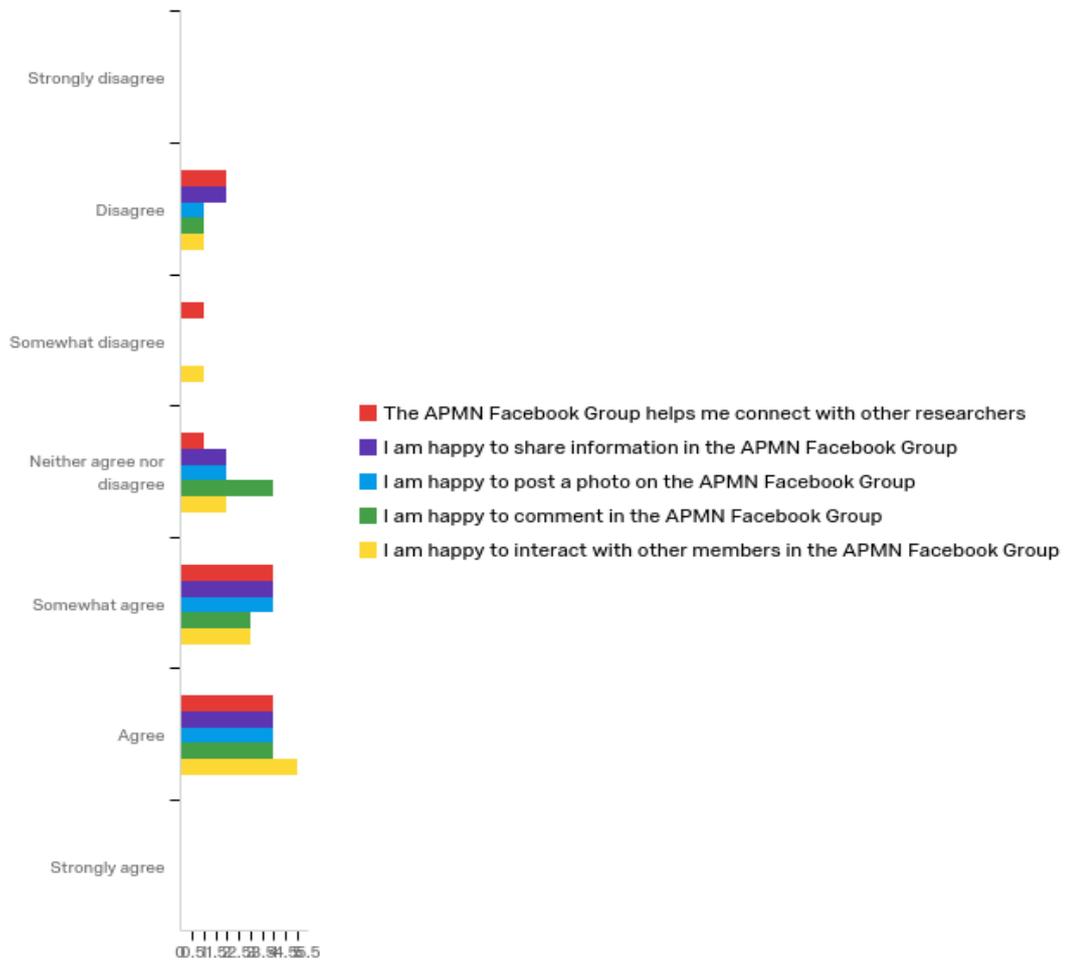Figure 1: Perception and behaviour regarding APMN Facebook Page

Figure 2: Perception and behaviour regarding APMN Facebook Group