

# Development of an Online Learning Management System for the Pacific Plant Biosecurity Partnership

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FINAL REPORT \ \ OCTOBER 2020

## Reference No: C002048

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## 1. Introduction

Pilot activities for the Pacific Plant Biosecurity Partnership (PPBP) Learning Management System (LMS) have concluded with 84% of Fellows using the LMS providing feedback. This report aims to provide information on usage, lessons learnt, and proposed updates for the system to benefit the remaining time of the PPBP program until June 2021.

The PPBP LMS is intended as a tool to improve access to, and understanding of, information while fostering stronger networks. From the past year of PPBP program activities it is well positioned to assist regional organisations and other development programs to deliver their mandate and programming activities to a broader audience than might have originally benefitted.

It is proposed that the PPBP LMS be released to a much wider audience now that testing has completed. This would include more biosecurity staff from each of the original target countries Fiji, Kiribati, PNG, Samoa, Timor-Leste, Tonga, Tuvalu and Vanuatu; as well as countries that have ratified the PACER Plus agreement that will come into force later this year, this will potentially include Cook Islands, Nauru and Niue.

## 2. Fellows Uptake and Use of the Online Platform

Since the launch of the online platform on August 4, all Fellows' interactions with the Learning Management System (LMS) have been tracked. Additionally, project staff have conducted surveys and interviews to capture more qualitative information regarding use of the LMS.

The current courses were adapted from material developed for the planned Vanuatu workshop cancelled due to COVID-19, the structure of the courses followed the structure of the workshop across five days. Table 1 shows that each course has varying components, difficulty and proposed duration; and the course structure only allows sequential course completion in keeping with the original workshop planning. After consideration of the current user statistics, this framework for course delivery has been deemed less effective than intended. Proposals to update the course delivery, user engagement strategy, and course parameters are presented in Section 4.

*Table 1 Details of Current Courses*

| # | Courses  | Modules                                    | Details                            | Duration |
|---|--|--|------------------------------------|----------|
| 1 | Welcome to PPBP Online                         | Welcome to PPBP Online                     | Article Course: 3 pages; 2 quizzes | 0h 15min |
|   |  | PPBP Vanuatu Workshop Agenda & Details     | eBook: 5 pages                     | 0h 15min |
| 2 | Surveillance & Communication                   | Surveillance Part I                        | Slide Course: 35 slides; 7 quizzes | 2h 0min  |
|   |  | Surveillance Part II                       | Slide Course: 35 slides; 5 quizzes | 2h 0min  |
|   |  | Planning Your Communication                | Article Course: 7 pages; 4 quizzes | 1h 0min  |
|   |  | Planning Your Presentation                 | Slide Course: 30 slides; 5 quizzes | 1h 0min  |
|   |  | Assignment: Country Update                 | Graded Assignment                  | 0h 30min |
|   |  | Online Discussion                          | Survey Weblink                     | 0h 15min |
| 3 | Coconut Rhinoceros Beetle & Pest Risk Analysis | Coconut Rhinoceros Beetle (CRB)            | Slide Course: 18 slides; 5 quizzes | 1h 0min  |
|   |  | CRB Field Guide                            | eBook: 36 pages                    | 1h 0min  |
|   |  | Pest Risk Analysis (PRA)                   | Slide Course: 37 slides; 8 quizzes | 2h 0min  |
|   |  | Group Assignment: Express Regional CRB PRA | Graded Assignment                  | 2h 0min  |
|   |  | Online Discussion                          | Survey Weblink                     | 0h 15min |
| 4 | Ants and African Swine Fever                   | Biosecurity and Ants in the Pacific        | Slide Course: 36 slides; 6 quizzes | 1h 30min |
|   |  | Introduction to African Swine Fever (ASF)  | Slide Course: 30 slides; 7 quizzes | 1h 30min |
|   |  | Assignment – Impromptu Speaking            | Graded Assignment                  | 0h 30min |

|   |   |                                    |                                   |          |
|---|---|------------------------------------|-----------------------------------|----------|
|   |   | Online Discussion                  | Survey Weblink                    | 0h 15min |
| 5 | Networking,<br>Planning and<br>Partnerships | Public Private Partnerships        | Article Course: 6 pages; 1 quiz   | 0h 45min |
|   |   | What is Next for the PPBP Program? | Article Course: 1 pages; 1 survey | 0h 30min |
|   |   | Online Discussion                  | Survey Weblink                    | 0h 15min |

There is an extremely high level of detail available for user statistics. The date and time, number of attempts, the results and the duration of time a user takes for each quiz and item in each module seen above in Table 1 is tracked. In the interest of keeping this report readable, Table 2 presents a snapshot of this information broken down by country groups and gender identified by Fellows.

Because the courses only allow learners to complete them sequentially, the popularity of particular courses based on the systems tracking data can't be defined passed the second course *Surveillance and Communication*; this constraint is discussed further in Section 3. However all course topics were nominated by Fellows during the planning of the cancelled workshop and the most popular course topics were as follows with the associated percentage of votes:

- Monitoring and surveillance (52%)
- Climate change and pests (17%)
- Improving export compliance (9%)
- Invasive ants management (5%)

Out of the ten items nominated there were topics at either end of the spectrum of broad or specific, and most were interconnected and sharing the same foundational knowledge or skills. The project team and topical experts created the resulting courses to flow with these interconnections in mind. More detail is available upon request from previous PPBP reports detailing topic selection and prioritisation. In the months since the topics were nominated continued discussions with Fellows outlined that priorities have shifted to have more of a focus on escalating regional threats such as CRB, ASF and more recently fall armyworm.

The information seen below in Table 2 (second column from the right) references the sequential course numbers seen in Table 1 left most column. For example, reaching the course 2/5 refers to Fellows completing the *Surveillance & Communication* and so on. Table 3 shows gender disaggregated usage information, the *Courses Completed* column provides an average percentage for the number of courses completed against the number of courses enrolled in for both men and women. For example, on average men completed approximately one third of the courses that they reached in the sequential course order.

Table 2 LMS User Group Statistics

| Group            | Enrolled Fellows |            | Avg. Guidance Per Person | Highest Course Reached   |            |
|------------------|------------------|------------|--------------------------|--------------------------|------------|
| Fiji             | 3/4              | 75%        | 0h 40min                 | 2/5                      | 40%        |
| Kiribati         | 3/3              | 100%       | 0h 40min                 | 2/5                      | 40%        |
| Papua New Guinea | 3/3              | 100%       | 0h 40min                 | 2/5                      | 40%        |
| Samoa            | 2/3              | 67%        | -                        | 2/5                      | 40%        |
| Solomon Islands  | 3/3              | 100%       | 0h 40min                 | 2/5                      | 40%        |
| Tonga            | 1/3              | 33%        | -                        | 1/5                      | 20%        |
| Tuvalu           | 3/3              | 100%       | 0h 40min                 | 3/5                      | 60%        |
| Timor-Leste      | 3/3              | 100%       | 2h 0min                  | 5/5                      | 100%       |
| Vanuatu          | 3/3              | 100%       | -                        | 2/5                      | 40%        |
| SPC - LRD        | 1/1              | 100%       | 0h 30min                 | 2/5                      | 40%        |
| <b>TOTAL</b>     | <b>25/29</b>     | <b>86%</b> | <b>15h 50min</b>         | <b>23/50<sup>1</sup></b> | <b>46%</b> |

Table 3 LMS User Gender Disaggregated Statistics

| Group        | Enrolled Fellows |            | Avg. Guidance Per Person | Courses Completed |
|--------------|------------------|------------|--------------------------|-------------------|
| Men          | 11/13            | 85%        | 0h 50min                 | 33%               |
| Women        | 14/16            | 88%        | 0h 50min                 | 45%               |
| <b>TOTAL</b> | <b>25/29</b>     | <b>86%</b> | <b>15h 50min</b>         | <b>39%</b>        |

<sup>1</sup> Total courses reached indicates the highest completion available based on group categorisation

User statistics have seen significant changes since a shift to a more engaging communication strategy from project staff after the first month of the LMS launch. The LMS tracks logins over weeklong periods with the average logins per period (lpp) being 12 lpp in the month of August, and experienced a 92% increase to 23 lpp on average for the month of September. This change was shifting from a user request for guidance approach (mostly text based i.e. emails, mobile messaging) to a scheduled communication approach (direct communication using groups where possible i.e. video calls, phone calls). The focus of this shift in the first instance was to gain feedback on user experience of the LMS. Results can be seen in Table 4 below. Of the 25 current users of the LMS, 13 women and 8 men completed the survey and provided information through the interview. Every country besides Tonga provided feedback.

Table 4 LMS User Survey Results

| #  | Question   | Response  |
|----|--|---|
| 1  | Did you take part in the Australian placements?  | <ul style="list-style-type: none"> <li>▪ 67% Yes;</li> <li>▪ 33% No</li> </ul>                              |
| 2  | Do you use the online platform on your phone or computer?  | <ul style="list-style-type: none"> <li>▪ 48% Both;</li> <li>▪ 33% Computer;</li> <li>▪ 19% Phone</li> </ul> |
| 3  | Have you downloaded the iSpring Learn mobile App?  | <ul style="list-style-type: none"> <li>▪ 71% Yes;</li> <li>▪ 29% No</li> </ul>                              |
| 4  | Do you find the online platform service difficult to use?  | <ul style="list-style-type: none"> <li>▪ 24% Yes;</li> <li>▪ 76% No</li> </ul>                              |
| 5  | Do you find the course content difficult to understand?  | <ul style="list-style-type: none"> <li>▪ 10% Yes;</li> <li>▪ 90% No</li> </ul>                              |
| 6  | Everyone is busy with their own work, would it be helpful if the online courses had deadlines and due dates? | <ul style="list-style-type: none"> <li>▪ 71% Yes;</li> <li>▪ 29% No</li> </ul>                              |
| 7  | Rate the support from the PPBP Team to sign up   | <ul style="list-style-type: none"> <li>▪ 93%</li> </ul>   |
| 8  | Rate the use of PPBP Online on the computer  | <ul style="list-style-type: none"> <li>▪ 93%</li> </ul>   |
| 9  | Rate course 1 content  | <ul style="list-style-type: none"> <li>▪ 74%</li> </ul>   |
| 10 | Rate course 2 content  | <ul style="list-style-type: none"> <li>▪ 92%</li> </ul>   |
| 11 | Rate the platform's messaging, review and question functions   | <ul style="list-style-type: none"> <li>▪ 86%</li> </ul>   |

There were many comments from the survey and additional information gained through the interviews, which formed project staff thinking on necessary updates described in the following sections. In essence these comments fall into three categories:

- 1) The PPBP LMS is a very welcome development for continuing delivery of the PPBP program information given travel restrictions. However, transitioning to online activities is difficult at first if there is limited experience;
- 2) The initial sign up process was the most difficult aspect of the online platform for most Fellows, once enrolled the LMS was straightforward to follow;
- 3) Time management is the biggest impediment to course progress. This can be improved by increased regular face-to-face (webinar, video or voice call) interaction between Fellows and project staff; scheduling deadlines and course availabilities; and providing certificates as incentives

### 3. Lessons Learnt

Some of the fundamental themes identified in the initial planning workshops have impacted the development and progress of the PPBP LMS. This includes high staff turnover in biosecurity agencies; agencies having competing priorities and are often under resourced; and agencies being vulnerable to external threats such as COVID-19, weather events, and emerging biosecurity threats. These points may not directly contribute to an updated LMS design however are important to note for the broader context.

In addition to the information provided directly by the Fellows seen in Section 2, the project staff have analysed the details of the user statistics and have come to the understanding that the original framework allows for too much learner control.

## LEARNER CONTROL

There are multiple trade-offs of learner control including learner satisfaction, the experience profile of the target learners, and the level of importance of skills being taught. One of the most consistent research findings is that learner control has little positive benefit for novice learners but may promote learning, or at least do no harm to those with high levels of domain-specific experience. The variation between both the Fellows' skills and experience in their professions; and also metacognitive skills, is extremely broad.

The original framework aimed to put Fellows in a high degree of control of pacing course progress; scheduling availability for group discussions; and parameters for deliverables. The intent was to make courses as unobtrusive as possible for under resourced biosecurity agencies facing national biosecurity threats and a pandemic. However, for the courses to be most effective to the most learners, minimising the degree of learner control will be important.

## STRUCTURED FOR LEARNERS

Also of importance is focusing on structuring courses specifically for the benefit of Fellows learning online and minimising elements that would have been most effective in a workshop setting. Meaning that online learning will be more effective broken down into more manageable chunks with clear segmentation between modules, and a consistent and relatively short duration of time needed to complete individual modules.

Table 1 above illustrates the great variation between courses and modules with Course 1 taking 30 minutes and Course 2 almost 7 hours. Each component of these courses can be paused and returned to at the will of the learner however making this more explicit in the structure and presentation will allow learners to better manage the required essential cognitive processing and most likely improve engagement with the courses.

## 4. Proposal for Updates to Course Delivery and Structure

The proposed details for course delivery seen in Table 5 combine the effective elements of the original design, with both the feedback from the Fellows and research based guidelines for e-learning developed by Richard Mayer and associates at the University of California. In essence the changes will be focused on:

- Updating the communication and course release strategy. Moving away from the learn at your own pace approach, to a collective momentum approach;
- Scheduling course availability and setting deadlines and due dates with certificates as an incentive; and
- Opt-in scheduled zoom discussions rather than relying on Fellows to elect best availabilities and initiate guidance discussions.

Table 5 Proposed Delivery Approach

|          |                           |   |
|----------|---------------------------|---|
| <b>1</b> | <b>Enrol Participants</b> | <ul style="list-style-type: none"><li>• Provide the option for learners to choose which courses to enroll in. A week-long call for sign up can be distributed through email groups and social messaging with the course to begin at the end of this duration;</li><li>• With pilot activities for the PPBP LMS completed the number of users from Pacific biosecurity agencies can be broadened and not every course will be relevant for every learner;</li><li>• Each course will be delivered one at a time in alignment with the collective momentum approach that fosters stronger collaboration and networking.</li></ul> |
| <b>2</b> | <b>Launch Course</b>      | <ul style="list-style-type: none"><li>• Suggested course length, approximately 2 hours cumulative time for all components (i.e. combination of slides, quizzes, survey or assignment). In alignment with segmentation principle.</li><li>• Suggested course duration 2 weeks, this allows ample time for completion around learner commitments. Setting deadlines and scheduled availability sets parameters for learner's time management;</li><li>• Full support will be provided within this 2-week window by project staff through the LMS, via email, social messaging, and calls if needed.</li></ul>                     |

|   |                            |   |
|---|----------------------------|---|
| 3 | <b>Discussion Sessions</b> | <ul style="list-style-type: none"> <li>• Scheduled discussion sessions midweek during the second week, at an appropriate time for the most users. Once the timing is decided it would be best to keep this same time consistently;</li> <li>• Questions will be submitted in advance as part of the course, this will allow others to benefit even if they can't attend at the time;</li> <li>• Discussion sessions will be structured consistently. With the host reading through the course slides to begin; then answering submitted questions; and then an open discussion;</li> <li>• Discussion sessions will be recorded and uploaded as part of the course for anyone that isn't able to attend;</li> <li>• Using this approach, we could aim for just one comprehensive discussion session, however more are possible depending on availabilities and demand.</li> </ul> |
| 4 | <b>Course Completion</b>   | <ul style="list-style-type: none"> <li>• Learners will receive a certificate, gain points and progress on the leader board;</li> <li>• Each course has a "Rate &amp; Review" tab which learners are encouraged to complete, allowing course improvement;</li> <li>• Once completed, the course will reside in the "Course Catalog" this is viewable by any learner enrolled in the LMS at any time. Learners can self-enroll and use all of the content at any time, however support and guidance for the course from project staff won't be active until it is run again. The course catalog will be a categorized repository for all training</li> <li>• If popular and there's a demand, the course can be rerun in the future with any relevant improvements made.</li> </ul>   |

The existing courses hosted on the LMS will require minor adjustments to the actual content to fit the proposed updates above. The majority of the changes needed will be to the method of delivery (proposal in Table 4), and the framework for housing courses.

The current framework has all courses active for all learners to complete sequentially, and structured and categorised to flow from one subject to the next. As seen above, the proposed update to this approach is having one course active at a time with full support provided to learners to collaboratively complete. Once completed the courses will then be moved to the "Course Catalog" into the appropriate category for those enrolled in the LMS to complete at any time.

The PPBP WhatsApp group has been an effective way to communicate throughout the program, through the interview process Fellows discussed the usefulness of having open informal communication with other biosecurity agencies. Fellows have been creating their own smaller groups stemming from the large all-inclusive chat group to discuss relevant issues, while this isn't measurable it is a great outcome. Tuvalu Fellows have had continued issues with WhatsApp, it is proposed that for the remaining time of the program a Facebook group or page is investigated to allow greater connectivity.

## 5. Proposal for Updated Course Content

The PPBP program will conclude June 2021, planning for a further phase is being considered but no arrangements have been finalised. A concept paper describing a potential further phase was distributed March 2020 and is available upon request, some of the concepts will be included in this section. Due to the COVID-19 operating environment the remainder of the program is to be delivered through the PPBP LMS. The PPBP program has focused on many nominated topics since the beginning of the program in May 2019 in either a face- to-face workshop setting or presenting the information through the current PPBP LMS format, see the March 2020 concept paper.

It can be seen from information presented in Section 2, that in the 12 week time period since the launch of the PPBP LMS pilot activities the majority of Fellows have progressed less than halfway through the courses. There is a limited timeframe and budget remaining until the conclusion of the PPBP program in June 2021. The resources required for guidance and communication by project staff to a broader group of users has been calculated as the equivalent of a full time position based on information seen in Table 2; and processes for course creation are the most time intensive of the LMS operations. It is proposed that the majority of courses to be delivered in the remaining timeframe come from the existing content with the necessary adjustments described in Section 4 made. A small number of new courses could be created in parallel to be delivered towards mid 2021, the topics of these new courses to be collaboratively prioritized by Pacific biosecurity agencies and development partners.

Table 6 presents a list of courses that project staff believe would be of most benefit to Pacific biosecurity agencies in a wider release of the PPBP LMS. This is a comprehensive list that won't be able to be completed within the PPBP

Program remaining timeframe. Feedback from Pacific biosecurity partners including SPC-LRD; PPPO; DAWE; MPI; and PHAMA Plus will determine the final prioritization of the course list to be completed in the remaining time until June 2021 with discussions for a further phase of the PPBP program ongoing

Table 6 Proposed Courses for Delivery until June 2021

| #  | Course   | Previously Presented | Potential Content Provider          |
|----|--|----------------------|-------------------------------------|
| 1  | Surveillance & Monitoring Fundamentals (Part I & II) | Yes                  | Sabine Perrone (BSASP)              |
| 2  | Coconut Rhinoceros Beetle Detection & Response       | Yes                  | Solomons BSI; PHAMA Plus            |
| 3  | African Swine Fever – Introduction                   | Yes                  | PHAMA Plus                          |
| 4  | African Swine Fever – Preparation & Planning         | No                   | PHAMA Plus                          |
| 5  | Threats from Exotic Ants                             | Yes                  | Monica Gruber (Pacific Biosecurity) |
| 6  | Pest Risk Analysis Pragmatic Guidelines              | Yes                  | Sabine Perrone (BSASP)              |
| 7  | Fall Armyworm  | No                   | ACIAR; DAWE; PHAMA Plus             |
| 8  | Pacific Pest List Database                           | No                   | SPC-LRD                             |
| 9  | Market Access Review                                 | No                   | PHAMA Plus                          |
| 10 | Public Private Partnerships                          | Yes                  | PHAMA Plus; STDF                    |
| 11 | Container Hygiene                                    | No                   | PHAMA Plus                          |
| 12 | Plant Biosecurity Standard Operating Procedures      | No                   | DAWE; MPI                           |
| 13 | Systems Approach to Biosecurity                      | No                   | DAWE; MPI                           |
| 14 | Introduction to Diagnostics                          | Yes                  | Sabine Perrone (BSASP); MPI         |
| 15 | Introduction to Biocontrol                           | No                   | AgResearch                          |
| 16 | Communication Strategy for Biosecurity Advocacy      | Yes                  | PHAMA Plus; The Crawford Fund       |
| 17 | Climate Change and Pests                             | No                   | PHAMA Plus; Monica Gruber           |
| 18 | <i>Add Items</i>                                     |                      |                                     |