STDF PROJECT GRANT APPLICATION FORM

Project Title	***Beyond Compliance Global*** – sharing tools for enhanced application of Systems Approach and market negotiation on plant pest risk
Objective	To increase opportunities for trade by enhancing competency and confidence in applying Systems Approach to specific export cases through the use of innovative decision support tools
Budget requested from STDF	US$ 580,474
Total project budget	Committed in kind inputs from the Centre for Environmental Policy, Imperial College London of US$ 89,642.00 Committed in kind inputs from the Near East Plant Protection Organization of US$ 75,000.00 Committed in kind inputs from the International Plant Protection Convention of US$ 37,578.00 Total project budget US$782,694.00
Full name and contact details of the requesting organization(s)	Mekki Chouibani, Executive Director: NEPPO (Near East Plant Protection Organization) Batiment C de l'INRA. Angle Avenues Ibn AL Ouazzane et Hassan II. Rabat. Morocco Tel : +212 673997808, +212 537 704810. Fax : +212537707863
Full name and contact details of contact person for follow-up	Orlando Sosa Implementation Facilitation Unit, International Plant Protection Convention, UN-FAO, Viale delle Terme di Caracalla, 00153, Rome, Italy.

I. BACKGROUND & RATIONALE

1. Relevance for the STDF

The *Beyond Compliance Global* proposal is to disseminate trade support tools to selected member country National Plant Protection Organizations (NPPOs) and the related regional plant health bodies, through the Implementation Unit of the IPPC. The Regional Plant Protection Organization, NEPPO, is requesting the project in conjunction with the team at Imperial College London, which will provide technical support. This proposal is to support a new phase of an earlier Standards and Trade Development Facility (STDF)-supported project grant (PG 328), *Beyond Compliance: Integrated Systems Approach for Pest Risk Management in SE Asia*, implemented by Queensland University of Technology, CABI and Imperial College London. The outputs and innovative decision tools of the original project are described in an eBook, *Beyond Compliance: a production chain framework for plant health*

risk management in trade, which has been published by Chartridge Books, Oxford (Quinlan *et al*., 2016), is available in English online (e.g. Amazon, Google books) and for free from the STDF website (http://www.standardsfacility.org/PG-328) by permission of the publishers. The 2016 ex-post evaluation of PG 328 gave a positive review of impacts. It is available on the STDF web site as well (http://www.standardsfacility.org/PG-328, see documents).

Beyond Compliance Global is designed as a three-year initiative to disseminate further the practice of systematic inclusion and evaluation of the full range of measures for pest risk management, in a manner proportional to the estimates of pest risk. While this will entail four or five trade cases, it also aims to embed expertise in two new regions for future support of new cases. The national and regional experts trained in the tools will be available for sustained implementation, additional to South East Asia where the initial project took place.

The objective of the project is to increase opportunities for developing countries to participate fully in trade by enhancing competency and confidence in design, evaluation and implementation of risk management measures through the use of innovative decision support tools. This enhanced capacity supports market negotiation so that export sectors can move beyond simply compliance with measures imposed by the importing country (shown as the typical progression in Figure 1), to a more empowered negotiating position incorporating a wider range of more efficient measures, illustrated in Figure 2, benefiting from partnership with the private sector export stakeholders. (Even the typical progression is still challenging for many participants or potential participants in trade.) The trade tools similarly support import decision making.

This typical progression of trade negotiations, shown in Figure 1, is confirmed by the results of a global survey of NPPOs, carried out under the Implementation Review and Support System (IRSS) with support from the European Commission. NPPOs from every region acknowledged the importance of trade-related International Standards for Phytosanitary Measures (ISPMs) but did not directly tie these to pest risk management standards, which had variable implementation (IRSS, 2014). NPPOs that responded ranked implementation of pest risk management standards in general as moderate. Respondents in the same survey noted the lack of infrastructure or resources to carry out the pest risk management plans required by a target market, in some cases, yet did not seek an equivalence agreement (described in ISPM 24 on determination and recognition of equivalent measures) for pest risk management more feasible to their country conditions.

In fact, ten years ago, of the over 2000 pest risk analyses (PRA) prepared globally since the endorsement of ISPMs 2 and 11 on that methodology, many – in some countries the vast majority – had not resulted in trade within 3 to 5 years after completion (Mumford and Leach, 2009). There is little reason to think this disappointing trend has changed in more recent years.

An enhanced capacity progression of trade (Figure 2), in contrast, may require some resources early on in the trade proposal but could save significant resources and time of both the public and private sectors. NPPOs continue to cite a lack of appropriately trained personnel as a major hindrance in implementing ISPMs in general (IRSS, 2014). The reality is that application of Systems Approach, described in ISPM 14 as the use of integrated independent measures for pest risk management, can require more management and guidance, often beyond the immediate capacity of the NPPO. This is achieved by focusing on feasible and financially rewarding trade opportunities, working from the base of an empowered NPPO and informed private sector.

To reach this enhanced capacity requires not only enhanced capacity of staff but also some institutional memory and capacity. The application of Systems Approach requires “a judicious selection of the available phytosanitary measures for risk management in the most

effective combination" (IAEA, 2011). Much of the systematic thinking about risk management in plant health has been carried out by individuals with long careers in the field; it is not a skill taught at university, or learned from books, but rather through long experience. In the future, transparent, consistent and justifiable decisions about combinations of measures can broaden and accelerate the value of those most experienced individuals. The opportunities afforded by additional pest risk management options must be supported by accessible tools if they are to be harnessed for developing countries facing staff turnover and heavy work portfolios.

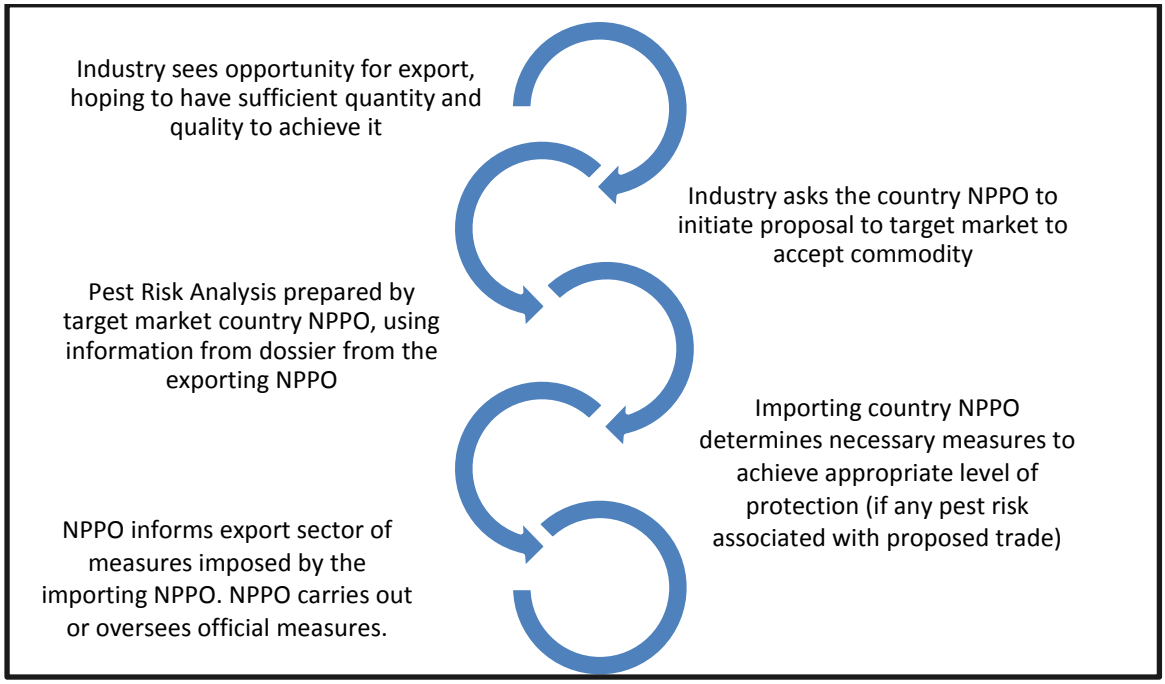

Figure 1. Typical progression of trade negotiations for developing country exporters

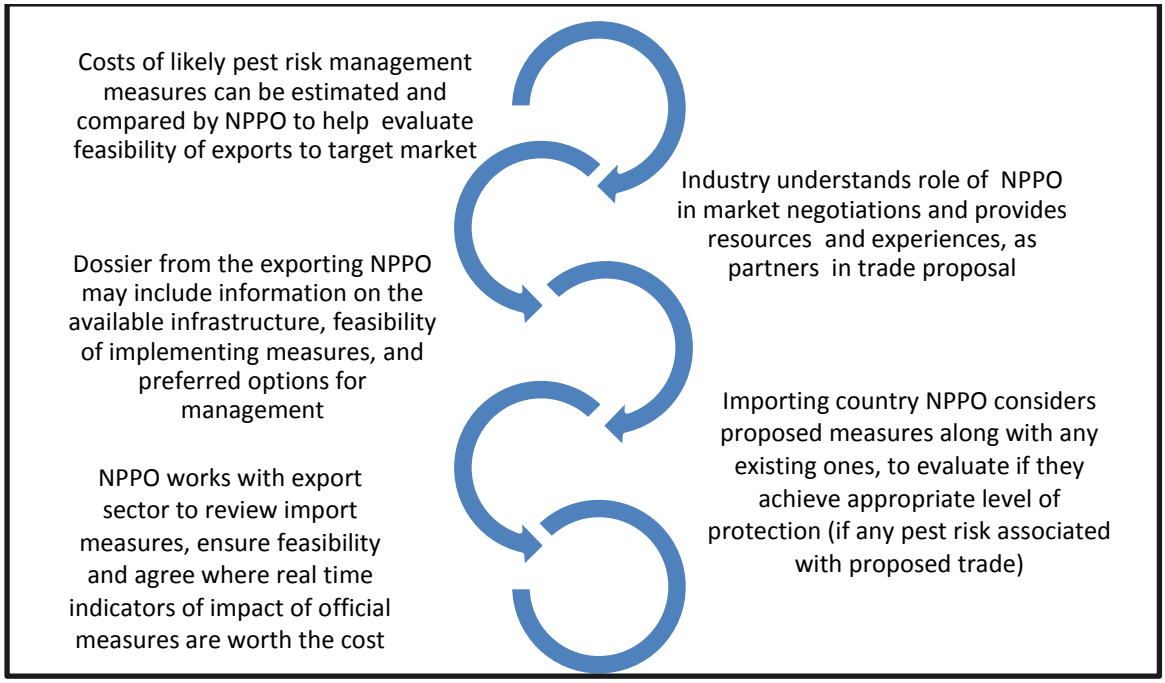

Figure 2. Enhanced capacity progression of trade negotiations for developing country exporters

The original project, *Beyond Compliance,* produced three interactive tools for qualitative and quantitative analysis of Systems Approaches applied to specific case studies at a national level:

1) a graphical Production Chain, that was used in engagement with stakeholders in four SE Asian national and two regional case studies (see final reports and eBook, at http://www.standardsfacility.org/PG-328), and an additional case in Australia (Johnson *et al*, 2015); this is a structured flowchart to describe the potential measures that could be adopted within a Systems Approach covering the whole of the production cycle
2) a spreadsheet-based Decision Support System (DSS), that was used in case studies in Vietnam, Philippines, Thailand, Malaysia and Australia, to elicit evidence about the performance characteristics of potential control measures for specific pest/commodity combinations of interest to the participating countries.
3) a Bayesian network (BN) model identifying official control points, used in Vietnam, Philippines, Thailand, Malaysia, and Australia to calculate the combined probability of successful performance of selected sets of measures which could be applied along the Production Chains. This probabilistic modelling tool uses the evidence and beliefs elicited using the DSS for these cases.

All of these tools have been taken up for at least one other case or another plant health project since the completion of PG 328. Uptake and adaptation experiences include some current European-funded projects (Horizon 2020 and FP7) EMPHASIS – Effective Management of Pests and Harmful Alien Species - Integrated Solutions; EUCLID - EU-China Lever for IPM Demonstration; DROPSA - Strategies to develop effective, innovative and practical approaches to protect major European fruit crops from pests; and a private company producing passion fruit in Vietnam.

The ex-post evaluation of PG 328 confirms that confidence and competence was increased within the participating NPPOs. The concepts, tools and interactions with stakeholders supported the capacity of NPPO staff to develop the scientific basis of Systems Approaches with practical local examples.

A major step for each of the NPPOs participating in PG 328 was more effective engagement with national stakeholders. All participating countries held multiple stakeholder meetings to talk through the process of developing a common approach to the description and implementation of measures that could inform trade negotiations. This was a significant demonstration of improved capacity in the NPPOs.

> Vietnam: Stakeholder meetings in two major dragonfruit areas; support to new dragonfruit growers' association and to development of VietGAP standards; liaison between research, extension and export groups within NPPO; involvement on trade developments to complement FAO/IAE area-wide dragonfruit pest management project that has created a core group of quality growers
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> Thailand: Stakeholder meetings with orchid export industry; NPPO presentation of a systems approach for EU export orchids at Thai National Plant Protection Conference (Taekul et al, 2013)

Philippines: Stakeholder meetings with export fruit industry; project concepts and descriptive tools used to address non-compliance and equivalence issues with China and S Korea

Malaysia: NPPO led national discussion on Systems Approach concept and its application to trade negotiations for jackfruit to China

Beyond Compliance has raised international awareness of Systems Approaches and the development of practical tools for their implementation. The Vietnamese NPPO invited the S Korea counterpart to attend a project meeting to see the way the process was developing. Outcomes of PG 328 were presented by invitation during a session of the International Plant Protection Convention (IPPC) Commission on Phytosanitary Measures (CPM), at the International Congress of Plant Pathology in Beijing (Mumford, Holt *et al*., 2013), and the New Zealand Plant Protection Society at Napier (Mumford, Quinlan *et al.*, 2013). The project was described in the EPPO Bulletin (Mengersen *et al.*, 2012) and the tools have been taken up as component inputs to the European projects noted above, among others. *Beyond Compliance* has collaborated with related projects in the SE Asian region, such as the FAO/IAEA area-wide fruitfly project on dragonfruit in Vietnam and a National University of Singapore study on a regional pest risk analysis framework, adding further to the network of skilled personnel across the region.

NPPOs in SE Asia, with observers from Australasia, have been exposed to a common set of descriptive and analytical processes that allow them to interact more effectively to negotiate new Systems Approach plans with each other, for intra or interregional trade. The IPPC Secretariat participated in the original *Beyond Compliance* project as part of the Steering Committee. They hosted a presentation about the tools, which included members of the Codex Alimentarius and other sections of Food and Agriculture Organization's (FAO).

The *Beyond Compliance* project also resulted in the creation of a network of staff in NPPOs with significant understanding of the Systems Approach concepts, some new decision support tools for a range of market access scenarios, and experience in working with export industry stakeholders to develop a stronger basis for negotiating the use of such approaches. The new proposal will lead to broader dissemination of these tools and further enhancement of confidence and competence in applying Systems Approach for trade to specific export cases in other regions. This aligns closely with the STDF mission and the IPPC strategy for national capacity building.

2. SPS context and specific issue/problem to be addressed

The project addresses both the application of ISPMs and market access.

Over the past twenty years, the community of members of the IPPC, represented by the CPM, have achieved major milestones in setting international standards and improving the process of standard setting. The principles of the IPPC (found in the Convention text) are reflected in the language of the WTO Agreement on the Application of Sanitary and Phytosanitary Measures (SPS), and *vice versa* as both have influenced each other over the years. More recently the CPM has begun to consider implementation of the ISPMs as well as the process of setting them. There has also been much progress in defining National Phytosanitary Capacity and its relationship to enhanced implementation of ISPMs (IPPC, 2012). The IRSS survey (2014) showed a broad implementation of the basic principles of the IPPC by national governments.

The use of risk analysis to underpin trade decisions is included in both the IPPC and the SPS Agreement and described in ISPMs 2 and 11. The use of a combination of integrated measures for pest risk management is elaborated further in ISPM 14. Yet more than a

decade after the global agreement on this standard, there is a lack of confidence in applying ISPM 14 and using more than one measure to reach the appropriate level of protection (Quinlan and Ikin, 2009; Whittle *et al.,* 2010). The Near East Plant Protection Organization (NEPPO), representing 14 countries, specifically ranked ISPM 14 on Systems Approach as one of the lowest in terms of implementation in that region (IRSS, 2014). Therefore, the importing country NPPO is generally the dominant party to develop a detailed plan for risk management and NPPOs from developing countries tend to accept the terms without considering the best operational choices for their own situation, which might affect effective delivery of a safe product.

Globally, a number of cases exist in which risk averse importing countries propose redundant measures which do not reduce the pest risk further with their addition, and the exporting country NPPO accepts the plan rather than challenge it. The attitude that it is better to secure the trade than to negotiate risk management more proportional to the risk, is contrary to the spirit of the SPS Agreement.

3. Links with national/regional development plans, policies, strategies, etc.

Most developing countries with any agricultural base have identified export of plant products as a key to economic development and inflow of hard currency. The status of the export sector is quite variable amongst developing countries.

For the Democratic Republic of Congo, for example, the Enhanced Integrated Framework (World Bank, 2010) stated that “the agricultural sector has the highest potential for poverty reduction”. Although the lack of an organised horticultural sector and low production will limit the chance for immediate returns from international exports, demands of regional markets will make the tools from *Beyond Compliance* a useful foundation for expansion. Countries prioritising horticultural trade but yet without significant levels of production, such as Burundi (Republic of Burundi, 2012), may use the *Beyond Compliance* tools to begin to engage and organise the private sector into a working partnership with the NPPO. Under the new project, countries or regions may apply to participate with a trade case. It may be appropriate to focus on concepts and simple tools for those situations with emerging export sectors, which are still getting organised.

One of the core tools developed in *Beyond Compliance* is a Decision Support System (DSS) spreadsheet, derived directly from ISPM 11, but with more detailed and systematic elicitation of performance criteria relevant for multiple measures, what is feasible for the setting, availability of infrastructure, etc. The DSS can represent a distribution of responses from experimental data or expert opinion, with an uncertainty ranking (Figure 3). This tool can be useful for internal NPPO evaluations of import proposals as well as for proposing measures for exports. It gives a visual cue on options and supports an ordered discussion by specific criteria, so that management decisions are well justified and documented. The tool also separates the intended efficacy of a measure and the actual implementation, if there are challenges which lower the effectiveness in field practice. This might include untrained staff, adverse climatic conditions, high pest challenge, etc. These features imply that decisions can be made in line with the priorities of the country, with transparency and repeatability.

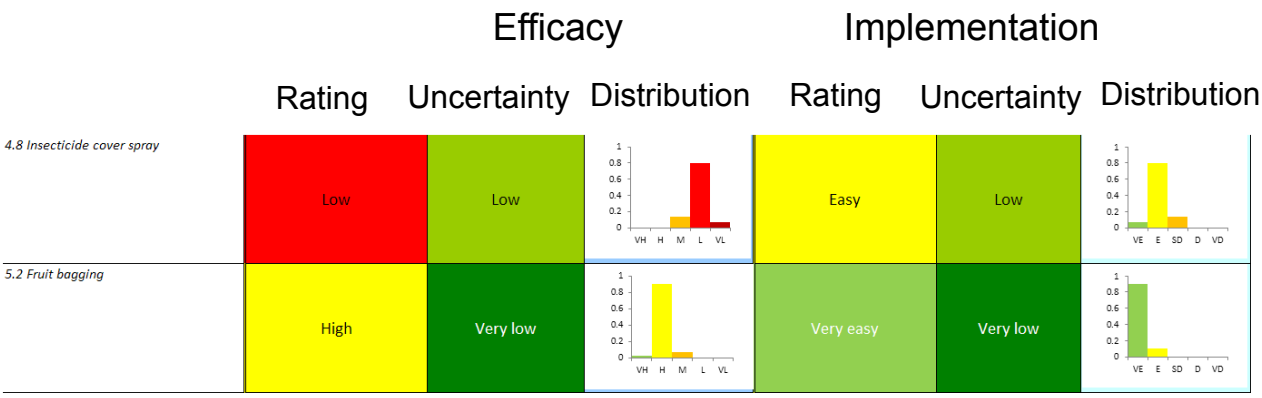

Figure 3. Example measures from the DSS where rating of impact and uncertainty can be shown graphically

If a country or region is selected to participate in *Beyond Compliance Global*, the specific policies and development plans supported by the trade case can be noted in the introduction of case reports. This will be highlighted in the reporting template. For example, if reduced use of pesticides or use of resistant varieties of crops are part of the national strategy, this will be noted in the case report with explanation of the linkages to the new proposal for measures to achieve market access.

For countries with environmental strategies, an important point often forgotten in vulnerable situations, too, is that systematic thinking about imports – including informal trade – could prevent entry of a new pest that could devastate the existing domestic and export crop sectors or natural flora and fauna. While the tools have not been applied to an environmental case yet, the opportunity to adapt the tools to that type of case (e.g. for pests of unmanaged forests) would be very welcome.

4. Past, ongoing or planned programmes and projects

The IPPC Implementation Facilitation Unit will lead the project with NEPPO. The subsidiary body of the IPPC responsible for implementation and capacity development, in its current structure as the Capacity Development Committee, agreed in December 2016 to fulfil the role of project steering committee for this project and to help with selection of appropriate cases. The Imperial College London (ICL) team will be supporting NEPPO and the IPPC for the technical aspects of the tools. They in turn will work with designated representatives of the NPPOs of selected countries. These various groups provide an extraordinary experience in and knowledge of plant health activities throughout the world, which will ensure that *Beyond Compliance Global* takes advantage of any opportunities for synergy. There is a long association between the IPPC, ICL and other technical support groups such as the Joint Division of IAEA-FAO. Coordination with other donor-supported and national projects and initiatives will be ensured by the involvement of the IPPC, as specific trade cases are selected.

The ICL team is at the forefront of developing better ways to consider the pest risk. The emerging best practice involves consideration of components such as the level of pest challenge, the probability of entry and the impact of management measures (Jamieson *et al.*, 2011). This allows one to estimate quantitative and semi-quantitative likely outcomes in terms of infested commodities at the point of import, for example (Mumford, Quinlan *et al.*, 2013). A European review of methods to evaluate the effectiveness of risk management options (MacLeod *et al*., 2010) concluded that a hierarchical rule based approach (developed in the PRATIQUE project, Enhancements of Pest Risk Analysis Techniques in the European Union, in which ICL was the partner leading the Risk Analysis work package) and a Bayesian Network (BN) approach combining risk elements were the most accurate. Although quantification of the efficacy or impact of management measures may seem intimidating, representations of the purpose and estimated impact of each measure provides an easily-understood and discussed output which can graphically communicate the advantages of various options. For example, once the structure is set up, sensitivity analyses can be used to contrast measures such as methyl bromide versus combined field measures (Taekul *et al.*, 2013).

5. Public-public or public-private cooperation

The NPPO is to deliver the plant health strategy for the country, but may not be the only government entity involved in market access initiatives or trade negotiation. The need for a "team approach" for market access negotiation is descried in the manual *Market Access A guide to phytosanitary issues for national plant protection organizations* (FAO, 2013). The *Beyond Compliance Global* project can provide a platform for better coordination among the public entities involved in market access. It provides the detail for those who are not plant health experts to quickly grasp the issues which may be in the debate in a negotiation and to "stick to message" for reaching the appropriate level of protection of the importing country, rather than entering into political trading.

The *Beyond Compliance* tools also provide a framework for communication with the private export sector regarding market access, maintaining markets when there are threats of trade disruption, and proposals for equivalence of measures when the existing requirements are not the most suitable for the exporting sector. Officially monitored control points in a system of measures can provide valuable real time data on whether the measures are performing as expected, which then allows rapid corrections or diversion of exports until the level of protection can be restored. This saves both money and reputations. Enhanced communication builds confidence even further and supports the legitimacy of the role of government, even when the private sector is better resourced and is leading the drive for market access.

The *Beyond Compliance* tools also provide a framework for communication with the private export sector on:

- which official measures would be feasible for the entire country's production sector, to be used for export,
- what measures are being applied in common commercial practice or across the spectrum of small farmer to large corporate production,
- how to demonstrate the adequacy of these measures in face of the estimated pest risk for the importing country,
- the unique role of the NPPO in establishing real (versus predicted) indicators of the pest threat at key points along a production or export chain, if control points are identified and monitored
- how all of these might relate to, and be distinguished from, voluntary measures for certification of quality on the same export streams.

The private export sector is often the instigator of market access requests (IAEA, 2011), although it remains the mandate of the government to conduct negotiations. These interactions with the private export sector could feed into other initiatives of the IPPC to better capture stakeholder benefits of the convention, such as noted in a recent discussion on indicators for the convention (Quinlan *et al.*, 2013).

6. Ownership and stakeholder commitment

Results from the earlier *Beyond Compliance* project were of great interest to several delegations on the occasions of the SPS Committee meeting (WTO, October 2013) and the CPM (April 2014). Countries more experienced with international exports have expressed interest in using the probabilistic modelling tool (BN described above). The selection of the countries to participate in the project will be made by the project steering committee. The project steering committee is the subsidiary body of the IPPC responsible for capacity development. If funding is approved, any IPPC contracting party's NPPO, Regional Plant Protection Organisation (RPPO) or regional entity in plant health could apply to participate in

Beyond Compliance Global. This proposal is supported by over fifty countries which are members of the WTO and contracting parties to the IPPC.

Three Regional Plant Protection Organisations representing three distinct regions of the world (Central America, Pacific Islands, and Northern Africa and the Middle East) sent letters of support for this application: the Organismo Internacional Regional de Sanidad Agropecuaria (OIRSA), the Pacific Plant Protection Organisation (PPPO) and the Near East Plant Protection Organisation (NEPPO). In addition, letters of support are included from six Sub-Saharan African countries. These appear in Appendix 4 (copies are from the 2015 application, all parties have been informed of the resubmission). Many representatives from other countries have expressed interest in participating.

II. PROJECT GOAL, OBJECTIVE, OUTPUTS & ACTIVITIES (LOGICAL FRAMEWORK)

7. Project Goal / Impact

The goal of the proposed project is to increase opportunities for export trade in plant products by developing countries. The greater opportunities will be based on the wider inclusion of more effective and efficient options for managing the pest risk, as estimated by the importing country NPPO, and for resolving issues when trade is disrupted. This will be achieved by enhancing competency and confidence in applying Systems Approach through the use of innovative decision support tools which are applied to real, priority trade cases.

The anticipated impact will vary according to the situation of the participating NPPO or regional entity. Some ideas for trade may not in the end meet market demand or opportunities, but the ability to evaluate and negotiate market access should be enhanced. If the importing country's appropriate level of protection appears to be reached with alternative measures which are described, mapped and quantified, the participating NPPO staff should feel more confident to pursue an agreement appropriate to the conditions of their country and export sector. (This does not necessarily involve presenting the completed tools, but rather arriving to negotiate with full clarity gained by completing the tools.)

The time it takes from submission of a trade proposal to completion of negotiations also should be reduced, although much of this depends still on the trade partner. Possible impacts are described in the log frame (Appendix 1). Figure 4 summarise illustrative outputs. Based on the earlier experience, it is expected that after participating in a trade case or workshop, a minimum of 75% of the participants will consider themselves more likely to use Systems Approach in the future and will start applying at least one of the *Beyond Compliance* tools. The project aims to support at least nine trade cases that reach the point of submission to the target market country's NPPO.

Illustrative cases	Intended impacts
• New trade proposal prepared (supported)	• Increased confidence in trade negotiation
• Equivalence proposal prepared (supported)	• More appropriate measures for country's situation
• Regional workshop to embed concepts	• Better defined role of NPPO and initial

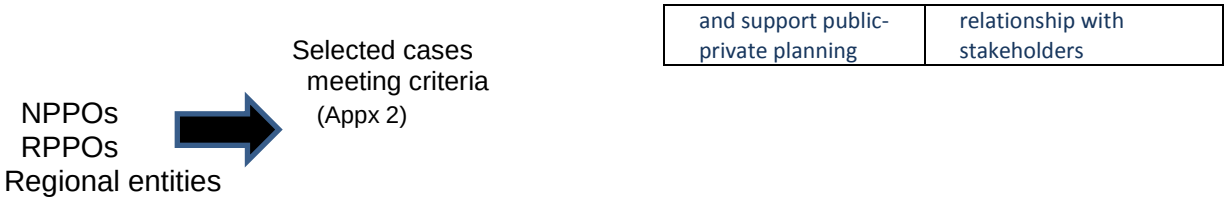

Figure 4. Schematic of Beyond Compliance Global process.

Other measurable indicators of impact will be selected with the Advisors after project inception.

8. Target Beneficiaries

The systematic approach to risk management also can support governmental intentions to reach specific beneficiaries. Benefits to small growers, women in agriculture and for poverty alleviation are admittedly indirect in this project, due to the focus on the market negotiation phase of export. However, understanding the production chain and the series of pest management activities needed to meet export requirements is a useful support to involvement of small growers and can lead to enhanced traceability of sources of products for export as part of the private sector understanding of Systems Approach. A relevant example arose during the SE Asian *Beyond Compliance* project for the Philippines. The already-agreed operational agreement for shipping commercial bananas to the USA was based heavily on a large corporation's field practices rather than the more widespread practices of smaller growers contributing to the supply chain. The use of the Production Chain mapping tool from *Beyond Compliance* led to a higher awareness within the NPPO of what pest risk management would be widely feasible and to a more effective level of NPPO-stakeholder involvement.

Use of the probabilistic modelling tool from *Beyond Compliance*, the Control Point - Bayesian network, would allow a country to make choices that orients benefits of trade to a specific sector, for example as part of a poverty alleviation programme. This is achieved by altering the criteria for choices of measures. ICL Masters level students with no previous experience in plant health, or in general with BNs, demonstrated different final work plans in the course of a couple of hours based on the different criteria selected: lowest cost, highest reduction in risk, lowest environmental impact, greatest return, etc. An organised Decision Support System (DSS) also allows alternative weightings of criteria to be systematically considered. Each conclusion was transparent and justifiable, but simply expressed different objectives or values.

9. Project objective, outputs and activities (including logical framework and work plan)

The project has an immediate objective of increased uptake of the *Beyond Compliance* tools as a means of increasing understanding and confidence in use of combinations of pest risk management measures. The tools were already tested, improved and validated on limited cases in the subregion of SE Asia. *Beyond Compliance Global* will be extending the cases while embedding expertise to additional countries and regions, which also helps to disseminate experiences through existing regional networks and meetings on plant health. The use of these tools will directly support deeper understanding of ISPM 14 by those participating.

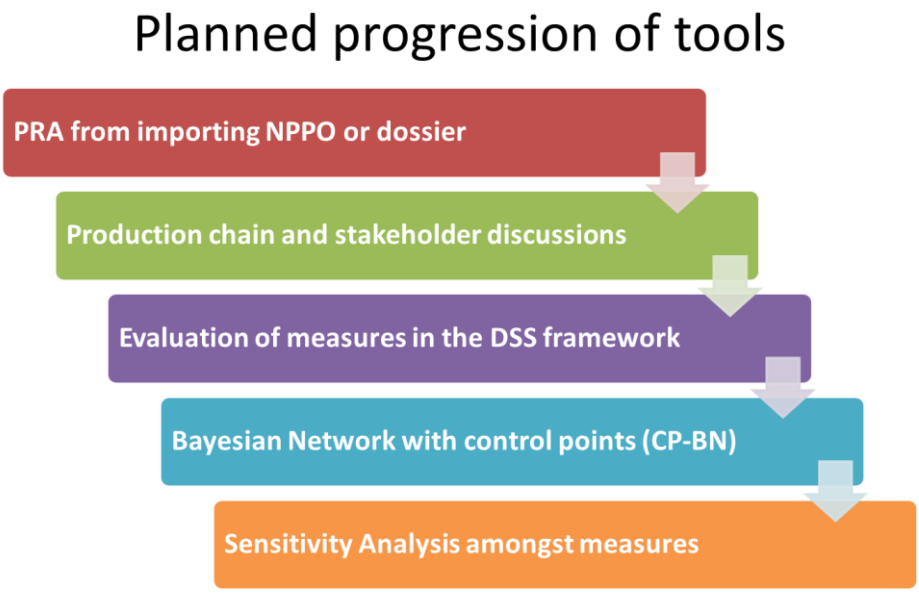

Figure 5. Original plan for progressive use of tools, whereas experience showed that individual tools may be used alone, or applied in a different sequence

The *Beyond Compliance* tools can be used together to develop an overall analytical framework for Systems Approaches (Figure 5), as was the original design. Experiences in SE Asia showed that descriptive tools (Production Chain, DSS) can be used without constructing a BN. As with the Phytosanitary Capacity Evaluation (PCE) tool, the tools from *Beyond Compliance* benefit from facilitation or initial training. Even the most intuitive and popular *Beyond Compliance* tool of mapping a Production Chain, which could be done using a blackboard or a piece of paper, can be more useful by using free software that permits the user to indicate causal and interacting relationships.

Figure 6. Example Production Chain showing map of measures undertaken from planting through to harvest and safeguarding during shipment

An example of a complete mapping of the Production Chain in Figure 6 shows how columns can be used to show objective of the measure, description of the measure, time/place/stage in chain, and any verification measures. In some cases, it was useful to colour code the measures by officially required vs commercial measures; current vs proposed or alternative measures; and risk reduction vs verification of performance measures. In other cases, only official measures were mapped and discussed. Therefore, training in even the most basic tool has been proven to augment the value of the output – principally the capacity of the participant.

Outputs will vary by the context of the trade case. The *Beyond Compliance* approach is to create a Bayesian network (BN) for each significant pest or pest guild, using figures straight out of the DSS (section shown in Figure 3) for quantification. The BN is based in the freely available GeNIe (Graphical Network Interface) software package (https://dslpitt.org/genie/) and has proven effective to debate a point of disagreement with sophisticated trade partners. However, less developed cases might benefit from developing a Production Chain with private sector without further application of tools until the feasibility and potential value of the proposed export can be determined.

The activities to accomplish the objective and outputs consist of:

Output 1 Trade cases selected from at least two regions or subregions
Activity 1.1 Project team established. Trade case templates complete (application form, reporting form, stakeholder meeting questions, questionnaires, etc).
Activity 1.2 Supporting and collecting applications for trade support
Activity 1.3 Selection of cases and MOU or other mechanism for working with cases
Output 2 Selected cases are initiated and facilitators are trained
Activity 2.1 Identify facilitators; contract or make institutional arrangements
Activity 2.2 Train facilitators
Activity 2.3. Translation and publishing or posting of materials contracted and complete
Output 3 Selected cases are developed
Activity 3.1 Development of the case concepts (problem formulation and stakeholder relations)
Activity 3.2 Country specific verification of case material
Activity 3.3 Tools applied to cases
Activity 3.4 Case reports and evaluations
Output 4 Implementation of cases
Activity 4.1 Case submissions to market partner NPPO are prepared and reported to project

The project aims to have as many submissions for review by the target market NPPOs as possible in the time frame of the project, and to identify a mechanism for collecting experiences over time in regard to outcomes of these negotiations. This will support and interact with other initiatives under the IPPC and the STDF portfolio.

10. Environmental-related Issues

Environmental issues are tackled indirectly by the *Beyond Compliance* project through the promotion of a Systems Approach and integration of Good Agricultural Practices. The use of practical tools to help with the implementation of ISPM 14, predominantly in developing countries, promotes the principle of equivalence of measures. This is most often the case of employing a number of less intensive pest control measures to achieve the same efficacy as a single, high intensity measure. In the remit of this project, a Systems Approach promotes a shift towards integrated pest management (IPM) techniques, reducing the requirement and use of chemicals to manage pests. This has been shown to have profound environmental and human health implications, whilst maintaining an appropriate level of phytosanitary protection for importing countries.

The ex-post evaluation of the initial *Beyond Compliance* project in South East Asia environmental considered it too early to tell if there is reduced use of pesticides during production or post-harvest fumigants from the move towards Systems Approaches. However, the perceived impact on plant health and the environment was very positive. A number of environmental benefits were identified by users of the project including support of governmental environmental policies, increase plant health and, in some cases, increased environmental protection awareness amongst workers.

As stated, whilst the benefits to the environment from the *Beyond Compliance* project are not direct, the benefits are significant and many. Furthermore, there is an option to adapt the tools to an environmentally focused case in addition to trade cases, to determine the direct effects the project can have upon the environment in a specific context. For example, the tools could be used to consider risk management options against pests of unmanaged forests or amenity trees. This is not expected to arise in *Beyond Compliance Global* but might be an interesting add on from other funding sources.

11. Risks

Participation in the project assumes a certain level of stability in the country and a strong political will to increase agricultural exports. This is not a passive training exercise but rather a very responsive process of the NPPO proceeding with its ongoing critical tasks, with support from an expert team. If the NPPO is not committed, the tools will not work. It is hoped that the selection process and support from Advisors will illuminate any lack of commitment or imminent changes in personnel involved.

Additionally, any regional difficulties that would prevent a normally scheduled meeting, such as of an RPPO, should be fairly easy to identify at the time of case selection. The project relies on participation in existing meetings, as well as project supported ones. The previous project made clear how the process of developing a case and transferring the skills for using the tools benefits immensely from regular face to face interaction.

External stakeholders must also be engaged. Systems Approach, in particular, requires collaboration with the growers and shippers, since measures may be applied along the entire chain. This implies some organisation and cooperation of the private export sector itself, in order for the NPPO to engage with them. While it is useful for this structure to be in place, the use of the *Beyond Compliance* tools themselves provoked a formalization of a producers association and more stakeholder meetings in countries such as Malaysia and Vietnam than had previously occurred in the particular trade sectors. In Thailand, the tools showed convincing evidence that a methyl bromide treatment could be removed from the Systems Approach. Ultimately the need for a demonstration plot was recognised, in order to achieve such a fundamental shift in thinking on the part of both the industry and the government's research sector.

An application with a trade case should have evidence of the related private sector's support and interest. Project support for new computers, web cameras and possibly even internet service should serve as an incentive to use the project templates to initiate and develop a case, before significant time is devoted by the technical team.

The most significant impact would be if none or too few of the many countries supporting this proposal follow through and apply to participate. In the very worst case, funding would then cease after the first year when current materials have been translated, guidance is posted on widely accessible websites and templates to support development of trade proposals are complete. The part-time administrator is the only one being hired specifically for this project, so remediation for this risk is to have his or her contract run on a year by year basis.

12. Sustainability

The *Beyond Compliance* tools to be employed are already tested by several trade cases, but do not yet cover all types of pest risk from trade in plant products. It became clear in the earlier project that some tools are taken up quickly and others require facilitation even after initial training. This is similar to other capacity evaluation and enhancement tools used in plant health – the Phytosanitary Capacity Evaluation (PCE) and the Performance, Vision and Strategy. By the end of this new project, it is expected that guidance and experiences of

using the *Beyond Compliance* Production Chain approach will be so well developed as to allow NPPOs to proceed without facilitation.

Important import market regions are undergoing changes in their own procedures for decision making. The country members of the European and Mediterranean Plant Protection Organisation (EPPO), for example, already received a plug-in Excel-based set of questions to support decisions about Systems Approach as part of the European PRATIQUE project (the plug-in being the precursor to the *Beyond Compliance* Decision Support System tool). The enhanced version completed in this project could easily be added into the on-line Pest Risk Analysis system of EPPO (called CAPRA), which is available for use by other countries, or could become part of the materials for PRA support provided by the IPPC. This would require revision only when the ISPM 11 or 14 is revised, which could be built into the costs of revision of those standards.

III. BUDGET

12. Estimated budget

The proposed budget appears in Appendix 3, by activity and by line item. An estimate of the STDF and in kind allocations per activity appears in the same section. The applicant is requesting approval from STDF US$580,474. The total project cost with the in kind contributions is estimated at US$782,694. NEPPO will oversee expenditures, but the overall funding will be held in IPPC for use and distribution following FAO policies.

In addition, NEPPO will contribute an estimated USD$75,000 during the project life as follows:

- to assist the secretariat with selection of countries according to established criteria and to liaise with other RPPOs and NPPOs.
- to participate in facilitator selection and training as necessary (including language support (French/Arabic)) and to contribute to related work with the IPPC-IFU-CDC and ICL
- to help in dissemination of results in languages and through bulletins and websites that NEPPO has access to.
- to contribute staff time in preparation of the final report and to participate in discussions in the assessment

Imperial College London would top up project funding with in-kind contribution of professional and administrative staff to ensure successful completion of the project. The estimated value of the in-kind contribution is expected to be in the order of USD$89,642.

The IPPC will contribute approximately US$37,578 toward implementation of the project but may avail additional resources, particularly through linkages with other projects under its operational portfolio. This will ensure that full advantage is taken of potential synergies of this project with others during the project cycle.

As is customary with implementation of IPPC/FAO projects, countries that are selected to participate in the project will be required to provide in-kind contribution in terms of local arrangements to support capacity building activities such as training, hosting of facilitators while in country, transportation and local costs of participation of national staff while the project is active. Proper allocation of staff to conduct the case using *Beyond Compliance* tools could easily require half-time of a senior NPPO staff person over the course of a year. It is assumed that this is a priority supported by the NPPO management. Therefore, the actual in kind contributions will be calculated more precisely at the time cases are done and a contribution from participating NPPOs could be much higher.

The investment of time by senior staff from potential advisory groups, including the IPPC Secretariat, also is not included in the total cost, although travel and similar support for their participation is included.

Around 24% of the total budget (just under 40% of requested budget) is assigned for the support and management of the project by the ICL team. This will depend on the number and type of cases, but is based on experience of the previous project and ideas about possible cases. A maximum of four country cases will be accepted under the project.

13. Cost-effectiveness

The objective of free trade requires capacity on all sides of trade negotiation. As plant health issues are understood more profoundly, governments are more likely to require risk management proportional to the estimated risk, rather than accepting excessive measures which alleviate concerns over lack of data but may actually do nothing to reduce the risk. There are many initiatives to support capacity development in plant health. This project is a very specific one, targeting the trade team and Pest Risk Analysis divisions to support an increase in confidence based on enhanced competence in understanding complex pest risk issues. With greater understanding, it is easier to argue one's case before other NPPOs. Yet the project goes even beyond demonstrating compliance with requirements for importing potential host material for pests. The increased confidence in the NPPO also supports a more effective relationship with the private sector.

The *Beyond Compliance* tools, entirely based on Microsoft Excel® or free publicly developed software, provide a framework for communication of the evidence, plans and expectations of the exporting NPPO in an organised fashion so that individual conclusions may be easily challenged and analysed by the importing NPPO. This supports cost-effective negotiation because of the ease of considering alternatives. In previous scenarios, trade negotiations have been bogged down in details which, with a proper sensitivity analysis, could be shown to be irrelevant in terms of the residual pest risk. Even on the level of international standards, this has sometimes required years of consultation and negotiation. Shortening the time and resources required to reach an agreement – or to express clearly what the importing NPPO disagrees with – is highly cost effective.

The alternative of not taking any action to enhance the application of Systems Approach would be *status quo* for the plant health community. Combinations of integrated pest risk management measures were already widely used by some countries even before the ISPM 14 was elaborated and endorsed. The staff in countries with less experience or less resources remain hesitant to employ combinations of measures (Whittle *et al*, 2010), however, in part due to difficulties in substantiating the efficacy of the entire system. Field application of Systems Approach can also require more training and additional intervention by official bodies, for example to carry out an inspection of premises or oversee use of a commodity treatment. There is an increasing need to rely on combinations of measures rather than single, end-point treatments as documented in Quinlan and Ikin (2009).

Countries are under pressure to reduce the time involved in responding to import requests or proposals for determination of equivalence. The USDA/APHIS, for example, began a new streamlined notification process for approved trade requests, which will accommodate Systems Approaches better than the previous streamlining achieved in 2007 (USDA/APHIS, 2014 and 2016). Despite reduction of time for decisions by an importer, NPPOs with staff less confident in application of combined measures are at a disadvantage in market access negotiations and tend to accept operational plans developed by the importing NPPO without challenging redundant measures. This leads to a "lack of confidence" cost of possibly unnecessary measures being required, which continues throughout the period of trade, which is often years before a new agreement is proposed.

IV. PROJECT IMPLEMENTATION & MANAGEMENT

14. Implementing organization

The oversight of the management and delivery of the project will be done by the IPPC. NEPPO will manage daily decisions related to participation in their region and provide guidance on engagement with RPPOs where relevant. Imperial College London, and more specifically the Centre for Environmental Policy, will be engaged under letter of agreement to deliver the technical aspects of the project. The project activities will be supported by the IPPC subsidiary body for capacity development throughout the project cycle. This body will serve as the project Steering committee.

The Centre for Environmental Policy, a department within the Faculty of Natural Sciences of Imperial College London, has worked with the FAO and IPPC Secretariat over many years. The ICL team for this project submitted financial reports to the STDF over the course of five years, initially as the implementer of a PPG and then through the Queensland University of Technology (QUT) which held the PG for the *Beyond Compliance* project in SE Asia.

Table 1. Subcontractors supported by project funds or in kind from their own institutions

Imperial College London's qualifications are summarised briefly in Appendix 5.

Category	Recruitment	Activities
Facilitators	To be determined. Identified through Advisors (below) and colleagues.	To master the tools, coordinate with local entities for workshop or case meetings; support NPPOs in elicitation with stakeholders. These individuals will interact directly with the Tech team to work on tool application for cases, especially when requiring languages other than English.
Advisors	Individuals from existing bodies such as the IPPC Secretariat, Subsidiary body for Capacity Development (or current equivalent), RPPOs or FAO regional offices, etc.	The project will draw upon expertise and on-going efforts in the area of trade support, market access negotiation, pest risk management and Pest Risk Analysis. It is anticipated that input will be provided through existing bodies or offices already tasked with support of these objectives. Therefore, the input will be extremely valuable but the requirements for comment, advice and support should not be onerous or additional to existing mandates.
Country NPPOs	As selected during the application process	NPPOs will need to allocate time of one or more employees in order to successfully participate in this project. However, the cases are to be priority trade cases which should already be anticipated under the staffing structure and resources. Initial criteria for participation as a case are shown in Appendix 2.

The named implementing team, as appears in Appendix 5 is uniquely qualified to work closely with the IPPC to deliver the final outcomes. Table 1 and details in Appendix 6 lay out the roles of various people outside of ICL.

15. Project management

Work plan decisions for the project will be made by the ICL team in close consultation with the IPPC and its subsidiary body for capacity development. A summary of responsibilities of all parties appears in Appendix 6.

Other expertise may be invited to provide inputs on an *ad hoc* basis. These would include experts with experience with the tools, for example from QUT and amongst the earlier project partners or observers (this latter group included the NPPO of New Zealand, NPPO of Australia and National University of Singapore). Ideally there will also be some on-going involvement of targeted *importing* country NPPOs from as early as possible. A close working relationship with the IPPC Secretariat will be essential to achieve maximum impact and long term sustainability.

The budget includes funds for travel of various parties, including Advisors, to participate in either workshops or already existing plant health meetings which may be focused on the topic. For individual cases, the ICL team and Facilitators are provided with a budget for

travel to occur as required. In many cases, a personal visit is needed to begin use of the tools. Once started, extensive progress on cases will be made through remote meetings using Skype or similar software. A line item in the budget supports partners with the necessary equipment, including laptops if required, and the internet services if this is not already adequate to the purpose. In addition, the project will rely on routinely scheduled meetings, such as the CPM, Technical Consultation of the RPPOs, or annual RPPO or other regional or sub-regional meetings to share information about the opportunity to apply for support of a trade case and to disseminate outcomes.

V. REPORTING, MONITORING & EVALUATION

16. Project reporting

If the proposal is approved, the estimated start date will be initiated in agreement and accordance with the established procedures between the IPPC and the STDF. A proposed schedule of reports to be prepared by the IPPC with input from NEPPO and ICL is presented in Table 2. This ambitious schedule is based on the existing relationships and contractual precedents among the entities. In addition, case reports will be prepared by the NPPOs, RPPOs or other entities involved in trade cases and/or travel, workshop or meeting reports will be completed as such arise. Such reports and other project materials will remain available to STDF and all Advisors, Facilitators etc. through a Dropbox™ folder.

The first reporting period will capture the initial preparations, some of which will occur before the official start of the project, whereas the next report is proposed to cover a period of six full months when regional facilitators and some cases will have been selected and work on trade cases initiated. These timings also correspond with STDF Working Group meetings.

Table 2. Proposed reporting dates

Covering pre-inception preparation (project inception) By April 30, 2017	Inception report	Summarising performance indicators for ICL team, presenting templates for project applications and reporting, update on identifying and training Facilitators, update on decisions about translation of materials.
Covering the following 6 months (April - September 2017) By October 15, 2017	First progress report	Summarising performance indicators of the Facilitators, initial applications and selection of cases, progress on first cases and/or any workshop or meetings.
Covering the next 6 months (October-March 2018) By April 15, 2018	Second progress report	Presenting translated materials and actions on disseminating them. Progress on cases, selection of any new cases. Feedback from participants to date. Summary of any new challenges for the tools, technical response, and any lessons learned for facilitating.
Covering the next 6 months (April 2018-September 2018) By October 15, 2018	Third progress report	Progress on cases including some final reports, selection of any new cases. Summary of any new challenges for the tools, technical response, and any lessons learned for facilitating.
Covering the next 6	Fourth	Progress on remaining cases, some final reports,

months (October-March 2019) By April 15, 2019	progress report	selection of any new cases. Summary of uptake of tools through dissemination activities other than direct cases, comments on challenges for applying the tools, response on any technical challenges, and any lessons learned for facilitating.
Comprehensive report, including progress over 8 months (April - November 2019) By December 15, 2019	Final report	Work with cases could continue, particularly to develop trade proposals. However, only cases with limited requirements would be taken up in the final months of the project. Report on evaluation of overall success of approach. Preparation of any final materials for dissemination.

17. Monitoring and evaluation, including performance indicators

The performance of three groups will be evaluated by the IPPC and NEPPO against pre-set indicators using simple questionnaires and milestone monitoring: the ICL team, the Facilitators (during training and in the role of supporting country work) and the NPPOs or other implementing bodies (those pursuing a trade case) themselves.

The project's progress will be measured every six months in terms of delivering specific outputs, which will be established on concrete delivery objectives independent of other participants. This is an unusual project because it relies on country NPPOs or RPPOs applying to participate, before cases will begin. There are a number of preparatory activities, however, which are beneficial regardless of the timing of the first case. If considered a priority, the preparation of guidance materials in languages other than English should lead to expanded use of the materials and tools by additional NPPOs, regardless of participation in the project.

The indicators for the other two groups (the Facilitators and the trade case groups) will be discussed in advance as part of the contract or MOU developed between ICL and the latter two groups. The performance of the participating NPPO, RPPOs or other regional entities essentially is measured only by the preparation of reports and sharing of outcomes. The result of trade negotiations is not an appropriate indicator of these entities' efforts since numerous factors affect trade. Even if the delaying issue is related to plant health, only the importing NPPO can progress the final agreement terms.

Finally, the overall outcome of the project rests on the combination of performance of these three groups, and that will be considered with external Advisors as described in Table 1. Possible indicators are listed in the logical framework (Appendix 1), but input from Advisors will be sought on all counts before indicators are considered final.

18. Dissemination of the projects results

The final project results can be incorporated into revised versions of the *Beyond Compliance* eBook or through other media, STDF and IPPC portals, and presented at key plant health routinely schedule meetings. Some of the results may be appropriate for publication in a widely accessed or open access journal. It is expected that experiences of the participants will be shared more informally throughout the project and through case reports, made available to the IPPC and STDF.

The most important way to disseminate results is for trading partners to see the value in use of these tools and take them up for future cases of their own. This had occurred already with two of the four focus countries in the *Beyond Compliance* project in SE Asia; for example, the NPPO in Philippines had applied the Production Chain to negotiate an alternative to an emergency measure requested by a trading partner, when the existing management measures were proving insufficient and the target pest was detected in trade.

Market negotiations are confidential and the project will last only three years, however, so one project activity will be to determine which existing bodies are able and willing to collect information about such negotiations, without compromising confidentiality.

Acronyms

BC	*Beyond Compliance* (originally STDF project PG 328)
BN	Bayesian network
CPM	Commission on Phytosanitary Measures
DSS	Decision support system
EPPO	European and Mediterranean Plant Protection Organisation
FAO	Food and Agriculture Organization
IAEA	International Atomic Energy Agency
ICL	Imperial College London team proposing this project
IPM	integrated pest management
IPPC	International Plant Protection Convention
IRSS	Implementation Review and Support System
ISPM	International Standards for Phytosanitary Measures
NEPPO	Near East Plant Protection Organisation (Plant Protection Organization of the Middle East)
NPPO	National Plant Protection Organisation
OIRSA	Organismo Internacional Regional de Sanidad Agropecuaria
PCE	Phytosanitary Capacity Evaluation
PPPO	Pacific Plant Protection Organisation
PRA	pest risk analysis
RPPO	Regional Plant Protection Organization
SPS	Agreement on the Application of Sanitary and Phytosanitary Measures of the WTO
STDF	Standards and Trade Development Facility
WTO	World Trade Organization

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ATTACHMENTS

Appendix 1: Logical framework

Appendix 2: Work Plan

Appendix 3: Project Budget

Appendix 4: Letters of support from organizations that support the project request

Appendix 5: Written consent to implement the project

Appendix 6: Terms of Reference for key staff involved in project implementation