

The *Feed the Future* Innovation Lab for

# Integrated Pest Management

# Technical Workplan

2014–2015

DRAFT: January 25, 2015

## IPM IL | Integrated Pest Management Innovation Lab

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FROM THE AMERICAN PEOPLE



 **VirginiaTech**  
Invent the Future

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The following work-plan outlines the tasks that will be undertaken during FY 2015. Due to a delay in meeting with the host country missions identified in the proposals, we are only be able to provide a summary of the necessary tasks and a timeline describing when each task will be completed. The illustrative timeline for the work-plan will cover the period January 26, 2015 to September 30, 2015.

**Sub-awards: Focal Countries and Activities of the Feed the Future IPM Innovation Lab**

Sub-awards	Activity	Country	Potential Collaboration
1	Rice IPM in Burma and Cambodia	Burma and Cambodia	Collaboration with FtF Sustainable Intensification Innovation Lab
2	Grains IPM for Nepal	Nepal	CSISA
3	Using Crop Diversity as an IPM Tool	Asia/Africa	USAID Biodiversity Team
4	Grain Crops IPM in Africa	Ethiopia and Tanzania	Collaboration with Post-harvest Loss Innovation Lab in Ethiopia; Africa Rising
5	Modeling for Biodiversity/Climate Change	Nepal	USAID Biodiversity Team
6	Vegetable Crops IPM in Asia	Bangladesh, Cambodia and Nepal	Collaboration with FtF Sustainable Intensification Lab; AVRDC; Hort IL
7	Vegetable Crops IPM in Africa	Kenya and Tanzania	AVRDC; Hort IL; Africa Rising
8	Exportable Fruit Crops IPM in Vietnam	Vietnam	ACIAR; USDA/APHIS
9	Invasive Species- <i>Parthenium</i> Management	Ethiopia, Kenya, Uganda, Tanzania	Sustainable Intensification IL
10	Invasive Species-Modeling for <sup>1</sup> South American tomato leafminer <i>Tuta absoluta</i> and <sup>2</sup> Groundnut leafminer <i>Aproaerema modicella</i>	<sup>1</sup> Europe, Mediterranean, and West, Central and Eastern Africa <sup>2</sup> Africa	AVRDC; Hort IL; Peanut/Mycotoxin IL

We have issued RFAs for two sub-awards – one for the **Biological Control of the Invasive weed *Parthenium hysterophorus* in East Africa**, and one for **IPM for Exportable Fruit Crops in Vietnam**.

## I. Concept Note Request for **Biological control of the Invasive Weed *Parthenium hysterophorus* in East Africa**



### **IPM INNOVATION LAB**

Feed the Future Innovation Lab for  
Integrated Pest Management

## **Call for Concept Notes:**

### **2. Biological control of the invasive weed *Parthenium hysterophorus* in East Africa**

The USAID Feed the Future Innovation Lab for Integrated Pest Management at Virginia Tech invites the submission of concept notes from U.S. universities, CGIAR institutions, and host country institutions to compete to lead the *Biological control of the invasive weed Parthenium hysterophorus in East Africa*. Concept notes will be reviewed and may lead to an invitation to submit a full proposal.

U.S. universities as defined under Section 296(d) of Title XII of the Foreign Assistance Act, CGIAR, and host country institutions are eligible to apply as the lead institution for a period of 4.5 years. Total funding (single award) is **\$0.75 million**. Collaboration or partnerships with relevant and appropriate host country organizations, other universities, the CGIAR system, and/or development community partners is required.

Concept notes for *Biological control of the invasive weed Parthenium hysterophorus in East Africa* are due **January 30, 2015**.

For complete information see: <http://goo.gl/oJ2kuv>

## Feed the Future Innovation Lab for Integrated Pest Management



### Request for Concept Note

#### *Biological control of the invasive weed, Parthenium hysterophorus in East Africa*

#### Calendar

Activity	Date
Issuance of request for concept note	December 23, 2014
Deadline for questions	January 9, 2015
Deadline for receipt of concept notes	January 30, 2015
Review and selection of concept notes for promotion to full proposals	Feb. 16, 2015
Requests for full proposals sent	February 24, 2015
Deadline for submission of full proposal	March 24, 2015
Proposal winner announced	May 1, 2015

This request for concept notes is issued by Virginia Tech, the Management Entity of the Feed the Future Innovation Lab for Collaborative Research on Integrated Pest Management (IPM IL). The Virginia Tech IPM IL is funded by the U.S. Agency for International Development under cooperative agreement AID-OOA-L-15-00001. The Virginia Tech IPM IL management entity offices are located at the Office of International Research, Education and Development, Virginia Tech, 526 Prices Fork Road, Blacksburg, VA 24061. For additional information please contact Dr. R. Muniappan, IPM IL Director, 540-231-3516, Email: <[rmuni@vt.edu](mailto:rmuni@vt.edu)> Website: <<http://www.oired.vt.edu/ipmcrsp/>>

## 1. Background

The **Feed the Future (FtF) Innovation Lab for Integrated Pest Management (IPM IL)** is a USAID-funded program that supports Integrated Pest Management research, technology transfer and capacity building in relation to small-holder farming systems. Virginia Tech was awarded a five-year contract on November 25, 2014 to serve as the management entity of the IPM IL. The IPM IL is now inviting the submission of concept notes designed to develop and implement biological control of the invasive weed, *Parthenium hysterophorus* in East Africa through a process of technology development, adoption and scaling up combined with human and institutional capacity building activities. Project activities may be proposed for four and one-half years (June 1, 2015 to October 31, November 16, 2019). Following evaluation of the concept notes, full proposals will be requested from a short-list of applicant(s).

Crop losses due to pests (insects, diseases, weeds, nematodes, birds, and rodents) are a major constraint to alleviating poverty and improving nutrition in Asia. Most estimates of production and post-harvest losses due to pests range from 30 to 40 percent. Improper use of pesticides poses a serious threat to health and biodiversity. IPM is a decision support system that uses evidence-based information to reduce losses due to pests, minimize reliance on synthetic pesticides, and foster the long-term sustainability of agricultural systems.

Integrated Pest Management (IPM) is defined as a dynamic, crop, location, and season specific program that combines all available compatible tactics that impart profit, safeguards environmental and human health, encompasses cultural sensitivities, and ensures social acceptance. The previous IPM IL emphasized development of IPM packages for selected crops by addressing problems faced by the farmers from the time of planting the seed to the harvest by developing alternate technologies to use of synthetic chemical pesticides. However, IPM IL does allow use of such pesticides when alternate technologies are not available or are proven to be ineffective.

Applicants are referred to the IPM IL website for additional information about the IPM IL:  
<http://www.oired.vt.edu/ipmcrsp>

The IPM IL will be implementing biological control of the invasive weed, *Parthenium hysterophorus* (Asteraceae) in East Africa (Ethiopia, Kenya, Tanzania, and Uganda).

## 2. Overview

The IPM IL invites the submission of a concept note from US universities, CGIAR Institutions, and Host Country Institutions that may lead to an invitation to submit a full proposal to lead the project on biological control of *Parthenium*. Illustrative East African institutions for possible collaboration are Ethiopian Institute of Agricultural Research (EIAR), Amahara Regional Agricultural Research Institute, Tigray Regional Agricultural Research Institute, and Haramaya University in Ethiopia; Makerere University in Uganda; Institution of National Museum of Kenya and Kenya Agricultural Research Institute in Kenya; and Sokoine University in Tanzania. Collaboration with other institutions like CABI; *icipe*; Agricultural Research Institute of South Africa; and University of Queensland and Department of Agriculture, Fisheries and Forestry, Queensland, Australia are also encouraged.

The project will:

Monitor spread of *Zygodonta bicolorata* that was released at Wollencheti in July 2014 in Ethiopia.

- a. Mass culture and release *Z. bicolorata* in additional regions of Ethiopia where Parthenium has established, in collaboration with regional and national officials.
- b. Evaluate efficacy of *Z. bicolorata* in suppressing Parthenium and its non-target effects.
- c. Mass rear and field release *Listronotus setosipennis* in Ethiopia and conduct post-release monitoring.
- d. Identify additional natural enemies to be released for control of Parthenium.
- e. Secure Ethiopian Government and USAID permits to import additional natural enemies of Parthenium, conduct host specificity test, and field release.
- f. Evaluate efficacy of released natural enemies and their non-target effects.
- g. Assist Uganda, Kenya and Tanzania in biological control of Parthenium through awareness-raising, strategic planning, and initiation of mitigation activities
- h. Partner with relevant host country organizations and other US universities, the CGIAR system, institutions in other countries and development community. The project applicant should demonstrate links to and leverage from the work of other relevant projects and avoid unnecessary duplication.
- i. Work with the Management Entity to design and implement an evaluation of the spread and economic impact of any biocontrol agents released for Parthenium weed suppression.

### 3. Research and Activity Priorities

The overall IPM IL has four program objectives:

- Advance IPM science, and develop IPM technologies, information, and systems for sound sustainable intensification;
- Improve IPM communication and education, and the ability of the practitioners to manage knowledge, resulting in widespread adaptation, adoption, and impact of ecologically-based IPM technologies, practices and systems;
- Provide information and capacity building to reform and strengthen policies and national institutions that influence pest management; and
- Develop and integrate sustainable resource-based local enterprises into national regional and global markets.

In order to accomplish these program objectives, the IPM IL activities will :

- Identify and describe the technical factors affecting pest management;
- Identify and describe the social, economic, political, and institutional factors affecting pest management;
- Work with collaborating groups to design, test, evaluate, and disseminate appropriate participatory IPM technologies, packages, and strategies;
- Work with collaborating groups to promote training and information exchange on participatory IPM;
- Work with collaborating groups to foster needed policy and institutional changes.



Key expected IPM outcomes include:

- Advancement of ecologically-based participatory IPM science, with ecologically-based IPM technologies, information, and systems for managing key pests on important crops in Africa and Asia.
- Improvement of IPM communication, increase in capacity of host-country scientific and outreach institutions, enhancement of ability of practitioners to manage IPM knowledge, and fostering of widespread adoption of ecologically-based IPM technologies, practices, and systems, with measurable impacts.
- Increased capacity of national institutions to reform and strengthen policies that influence pest management.
- Development of sustainable, resource-based local enterprises and their integration into regional, national, and international markets.

The overall purpose of the *Biological control of the invasive weed, P. hysterophorus in East Africa* project will be to suppress this weed in East Africa and to prevent its possible spread to Central and West Africa.

Specific activities will include field monitoring of *Z. bicolorata*, release and monitoring of *L. setosipennis*, identification and importation of additional natural enemies with necessary permits, host specificity testing, preparation of Environmental Assessments, field release and evaluation. Favorable consideration will be given to activities that involve significant scaling up of existing successful technologies in addition to the development of new technologies. A portion of the budget may be reserved for activities in support of areas identified through the IPM IL research sub-award competition. Such activities would necessarily be described after the sub-awardee is selected and that process will take place after the successful application is selected. To facilitate biological control of Parthenium a strong representation of entomology, plant pathology, weed science, agricultural economics, environmental science and gender is encouraged in the project.

#### **4. Capacity Building**

The project should include human and institutional capacity development at both the scientist and institutional levels. Details regarding the number of trainees, disciplines, location of training, and efforts to ensure gender parity of trainees, as well as the need for training of host country nationals, should be described in the concept note. Collaboration with host country universities is encouraged and may include curriculum development, academic support consistent with research programming, short courses, and other activities that support improved institutional capacity.

Outreach activities aimed at the end-user are required for all projects. These activities can occur via direct contact with end-users by project investigators or through third party organizations such as host country extension services, host country universities, NGOs, and NARS. Use of mass media (radio, TV, newspapers), internet, cell phones, E-Readers, on farm training, workshops and demonstration plots, for technology dissemination and scaling up is encouraged.

#### **5. Gender**

USAID policy requires that gender issues be addressed as appropriate for all USAID-funded activities and that gender differences and inequalities be integrated into the consortium activities and project design.

The application must present a gender analysis which discusses important gender issues relevant to appropriate IPM research, development and extension activities. The application must explain how gender considerations and equality issues will be integrated into the design, implementation, management, knowledge sharing, capacity building, and monitoring and evaluation of the overall consortium activities and individual projects.

## **6. Project Design and Evaluation**

The project must describe a results framework, including monitoring and evaluation, that is consistent with the overall objectives of the IPM IL supporting research, knowledge sharing, and capacity building and the ability to increase ecological intensification for the production of food. The framework must also support national objectives and will be part of the overall IPM IL Monitoring and Evaluation procedures. The project must be in compliance with USAID's Environmental Compliance Procedures described in Title 22 of the Code of Federal Regulations, Part 216 (22 CFR 216 [http://www.usaid.gov/our\\_work/environment/compliance/22cfr216](http://www.usaid.gov/our_work/environment/compliance/22cfr216)) and provide evidence of compliance with all relevant financial accounting procedures, regulatory compliance, responsible conduct of research, and the US Agricultural Terrorism Act of 2002.

## **7. Project Reporting**

An annual work plan, budget, semiannual activity report summarizing results, impact analysis and results, trip reports, and research reports and summaries will be part of the reporting requirements. The IPM IL staff, USAID staff, and IPM IL technical advisory committee will review and provide feedback. Amendments or changes may be suggested during the annual review with respect to program and budget. Funding for the overall IPM IL budget, and hence for the subcontracts, is allocated on an annual basis. The project should have contingency plans in place for a 10% cut in funding to demonstrate abilities to achieve outcomes under an uncertain Federal fiscal environment.

## **8. Concept Note Information**

### **Eligibility**

US universities as defined under Section 296 (d) of Title XII of the Foreign Assistance Act, CGIAR centers, and host country institutions are eligible to apply as the lead institution for a period of 4.5 years. IPM IL will subcontract with the selected institution, which will then subcontract with collaborating organizations, at least one of which must include a U.S. university if not led by one. The institution making the application will be responsible for negotiating into sub-agreements with all collaborating organizations and for accounting to the Virginia Tech IPM IL for all program accomplishments, expenditures, and reporting requirements. The concept note should identify the nature of any collaborations, the distribution of labor and activities between collaborating organizations, and the budget allocations among collaborating organizations.

The IPM IL strongly encourages concept notes from, or for concept notes to include, qualified Minority Serving Institutions. These include, but are not limited to, Historically Black Colleges and Universities, Predominantly Black Institutions, Hispanic Serving Institutions, Tribal Colleges and Universities, and Asian American, Native Alaskan and Pacific Islander Serving Institutions.

### Importance of Human Resource and Institutional Capacity Development

Human and institutional capacity building (HICD) are core objectives and concept notes should indicate how this will be strengthened. There should be a demonstration of meaningful collaboration in research and training between a Lead institution and one or more Host Country institutions (public research institutions, universities, NGOs, etc.). Other partners such as U.S. universities and public and private sector research institutions (CGIAR, International agencies etc.) may also be subcontracted.

Collaboration with multiple host country institutions is encouraged.

### Project Funding, Budget Guidelines, and Cost Sharing

Approximately US\$ 0.75 million is available through November 16, 2019 for the project. The concept note must contain a summary budget with projects and subcontracts clearly delineated using the budget template. Applicants are required to provide non-federal cost sharing which equals or exceeds any overhead earned on host country sub-awards. Favorable consideration will be given to proposals that further leverage consortium funding. At least 50% of the proposed budget should be spent to support in-country activities. Travel costs for host and U.S. scientists should be included and explained.

### Format and Evaluation of Concept Notes

Concept notes must be in English with narrative portions prepared in MS Word with Times New Roman font size 11 and 1.15 line spacing. The summary budget tables must be prepared in Microsoft Excel utilizing the attached template. Page size should be 8 ½ x 11" with 1" margins. Table 2 lists the guidelines for submission of concept notes.

<b>Component</b>	<b>Description</b>
Title Page	Title; name, institution address, email, phone, and fax for lead PI at lead institution; lists members, total project budget, timeframe, and funds requested from IPM IL.
Executive Summary	Maximum one page
Narrative Description	Describes the project membership with clearly identified roles and responsibilities of all members. Focal topics and geographic areas, IPM components and packages, and research needs should be clearly articulated. Barriers to adoption of IPM components and strategies to overcome them should be identified. Opportunities for supporting research sub-award projects, capacity building, knowledge sharing, and strategies for addressing gender issues should be described. Provide a management and staffing plan.
Anticipated Results	Provide a narrative description referring to the results framework with clear indicators of measuring project results.
Expected Impacts	Describe expected impacts and how they will be measured.
Activity Plan	Provide a timeline of activities over the 4.5-year life of the project
Budget	Provide a summary budget sheet and for the project lead institution and all project members that will receive funding. The format specified by IPM IL must be used.
Budget Justification	Provide a one-page justification/explanation of budget expenditures.
References	List references used in the concept note narrative
PI Qualifications	In one page, provide a description of the qualifications of the PI at the project lead institution and for all relevant members in the project.
Curricula Vitae	Provide the CV for each PI/collaborator whose participation is described in the concept note.

**Page length and order of sections**-The total page length of the concept note, excluding title page, one-page summary budget, one-page budget justification, reference list, PI qualifications, and CVs, is 6 pages. Assemble all sections of the concept note into a single file and convert to a single pdf file for submission. The sections should appear in the following order: 1) title page, 2) executive summary, 3) narrative description, 4) anticipated results, 5) expected impacts, 6) activity plan, 7) budget, 8) budget justification, 9) references, 10) PI qualifications, and 11) relevant CVs.

## 9. Selection Process

An independent Technical Advisory Committee will review and score all proposals according to the following criteria (Table 3). Input may be sought from ad hoc reviewers, host country institutions, USAID Missions, and other relevant development organizations in making the final selection.

<b>Table 2. Criteria used for the evaluation of concept notes</b>	
<b>Criteria</b>	<b>Weight</b>
Technical Merit, Including Management and Staffing	30%
Alignment with Target Country Research Priorities, IPM IL Goals and Objectives	20%
Knowledge Sharing and Outreach Activities	10%
Human and Institutional Capacity Development	10%
Gender programming	10%
Monitoring and Evaluation Activities	10%
Past Performance	10%

## 10. Submission of concept notes

**Questions** pertaining to concept notes should be sent to Dr. R. Muniappan, email: [rmuni@vt.edu](mailto:rmuni@vt.edu) by 11:59 pm Eastern Time on January 9, 2015.

**Concept notes should be submitted** to Dr. R. Muniappan, email: [rmuni@vt.edu](mailto:rmuni@vt.edu) by 11:59 pm Eastern Time on January 30, 2015.

### **Selected References**

Dhileepan, K. and L. Strathie. 2009. *Parthenium hysterophorus* L. (Asteraceae). In, R. Muniappan, G.V.P. Reddy and A. Raman (eds.). Biological Control of Tropical Weeds using Arthropods. Cambridge University Press, Cambridge, pp 274-318.

Mersie, W. and R. Muniappan. 2014. Status of *Parthenium hysterophorus* biological control in Ethiopia. Biocontrol News and Information 35: 34N.

Wabuye, E., A. Lusweti, J. Bisikwa, G. Kyenune, K. Clark, W. D. Lotter, A. J. McConnachie and M. Wondi. 2014. A Roadside Survey of the Invasive Weed *Parthenium hysterophorus* (Asteraceae) in East Africa. Journal of East African Natural History 103:49-57.

## II. Concept Note Request for **IPM for exportable fruit crops in Vietnam**



# **IPM INNOVATION LAB**

Feed the Future Innovation Lab for  
Integrated Pest Management

## **Call for Concept Notes:**

### **1. IPM for exportable fruit crops in Vietnam**

The USAID Feed the Future Innovation Lab for Integrated Pest Management at Virginia Tech invites the submission of concept notes from U.S. universities, CGIAR institutions, and host country institutions to compete to lead the *IPM for Exportable Fruit Crops in Vietnam*. Concept notes will be reviewed and may lead to an invitation to submit a full proposal.

U.S. universities as defined under Section 296(d) of Title XII of the Foreign Assistance Act, CGIAR, and host country institutions are eligible to apply as the lead institution for a period of 4.5 years. Total funding (single award) is **\$0.8 million**. Collaboration or partnerships with relevant and appropriate host country organizations, other universities, the CGIAR system, and/or development community partners is required.

Concept notes for *IPM for exportable fruit Crops in Vietnam* are due **January 30, 2015**. For complete information see: <http://goo.gl/oJ2kuv>

## Feed the Future Innovation Lab for Integrated Pest Management



### Request for Concept Note

#### *IPM for Exportable Fruit Crops in Vietnam*

#### Calendar

Activity	Date
Issuance of request for concept note	December 23, 2014
Deadline for questions	January 9, 2015
Deadline for receipt of concept notes	January 30, 2015
Review and selection of concept notes for promotion to full proposals	Feb. 16, 2015
Requests for full proposals sent	February 24, 2015
Deadline for submission of full proposal	March 24, 2015
Proposal winner announced	May 1, 2015

This request for concept notes is issued by Virginia Tech, the Management Entity of the Feed the Future Innovation Lab for Collaborative Research on Integrated Pest Management (IPM IL). The Virginia Tech IPM IL is funded by the U.S. Agency for International Development under cooperative agreement AID-OOA-L-15-00001. The Virginia Tech IPM IL management entity offices are located at the Office of International Research, Education and Development, Virginia Tech, 526 Prices Fork Road, Blacksburg, VA

24061. For additional information please contact Dr. R. Muniappan, IPM IL Director, 540-231-3516, Email: <[rmuni@vt.edu](mailto:rmuni@vt.edu)> Website: <<http://www.oired.vt.edu/ipmcrsp/>>

## 1. Background

The **Feed the Future (FtF) Innovation Lab for Integrated Pest Management (IPM IL)** is a USAID-funded program that supports Integrated Pest Management Research, technology transfer and capacity building in relation to small-holder farming systems. Virginia Tech was awarded a five-year contract on November 25, 2014 to serve as the management entity of the IPM IL. The IPM IL is now inviting the submission of concept notes designed to develop and implement sustainable IPM strategies for exportable fruit crops in Vietnam through a process of technology development and large-scale transfer combined with human and institutional capacity building activities. Project activities may be proposed for four and one-half years (June 1, 2015 to October 31, November 16, 2019). Following evaluation of the concept notes, full proposals will be requested from a short-list of applicant(s).

Crop losses due to pests (insects, diseases, weeds, nematodes, birds, and rodents) are a major constraint to alleviating poverty and improving nutrition in Asia. Most estimates of production and post-harvest losses due to pests range from 30 to 40 percent. Improper use of pesticides poses a serious threat to health and biodiversity. IPM is a decision support system that uses evidence-based information to reduce losses due to pests, minimize reliance on synthetic pesticides, and foster the long-term sustainability of agricultural systems.

Integrated Pest Management (IPM) is defined as a dynamic, crop, location, and season specific program that combines all available compatible tactics that impart profit, safeguards environmental and human health, encompasses cultural sensitivities, and ensures social acceptance. The previous IPM IL emphasized development of IPM packages for selected crops by addressing problems faced by the farmers from the time of planting the seed to the harvest by developing alternate technologies to use of synthetic chemical pesticides. However, IPM IL does allow use of such pesticides when alternate technologies alone are not able to control disease and pest pressure effectively enough to give the farmer an adequate yield and return on investment after harvest.

Applicants are referred to the IPM IL website for additional information about the IPM IL: <http://www.oired.vt.edu/ipmcrsp>

The new IPM IL will develop, implement, and scale up IPM packages for selected crops. USAID has requested, as part of the overall program, an IPM program in Vietnam for fruits (designated by the GoVN) to be of high export potential to the United States: lychee, longan, dragon fruit, and mango (Table 1).

Fruits	Geographical areas
Lychee	Northern Vietnam
Longan	Northern and Southern Vietnam
Dragon fruit	Southern Vietnam
Mango	Southern Vietnam

## 2. Overview

The IPM IL invites the submission of a concept note from US universities, CGIAR institutions, and host country research institutions that may lead to an invitation to submit a full proposal to lead the project on *IPM for Exportable Fruit Crops in Vietnam*. Some illustrative Vietnamese institutions and universities for collaboration would be: Plant Protection Department of the Ministry of Agriculture and Rural Development, Vietnamese National University of Agriculture, National Plant Protection Institute, Northern Fruit Research Institute (FAVRI), Southern Fruit Research Institute (SOFRI), and Nong Lam University.

The project will:

- a. Diagnose major diseases, insect, mite, and nematode pests of the above crops and develop alternative technologies where synthetic chemical pesticides are now used as a primary control tactic. Some of the major pest and disease constraints are fruit flies in all four crops, fruit borer and stink bug of lychee; witches broom disease and eriophyid mites of longan; brown spot disease of dragon fruit; and leaf hoppers, stem borer, fruit borer, and anthracnose of mango. In addition, several seasonal and regional pests of these fruit crops also need to be addressed.
- b. Develop IPM technologies and packages for lychee, longan, dragon fruit and mango. The IPM approaches used must be effective enough to help Vietnamese growers meet all U.S. entry requirements with regard to live organisms of quarantine significance and with regard to prohibited agro-chemical residues.
- c. Implement specific activities that support USAID Mission objectives with respect to IPM on these crops. Research activities must be conducted at experiment stations and in farmers' fields with the use of appropriate statistical designs. The project must partner with relevant and appropriate host country organizations and may partner or significantly link with other US universities, the CGIAR system, institutions in other countries, and development community partners. The project applicants should demonstrate links to and leverage from the work of other relevant projects and avoid unnecessary duplication.
- d. Transfer IPM technology to fruit producers through a dynamic technology transfer program.
- e. Plan and conduct economic and gender impact evaluations of the IPM technologies and packages.

## 3. Research and Activity Priorities

The overall IPM IL has four program objectives:

- Advance IPM science, and develop IPM technologies, information, and systems for sound sustainable intensification;
- Improve IPM communication and education, and the ability of the practitioners to manage knowledge, resulting in widespread adaptation, adoption, and impact of ecologically-based IPM technologies, practices and systems;
- Provide information and capacity building to reform and strengthen policies and national institutions that influence pest management; and



- Develop and integrate sustainable resource-based local enterprises into national regional and global markets.

In order to accomplish these program objectives, the IPM IL activities for this Sub-Award will include:

- Identify and describe the technical factors affecting pest management;
- Identify and describe the social, economic, political, and institutional factors affecting pest management;
- Work with collaborating groups to design, test, evaluate, and disseminate appropriate participatory IPM technologies, packages, and strategies;
- Work with collaborating groups to promote training and information exchange on participatory IPM;
- Work with collaborating groups to foster needed policy and institutional changes.

Key IPM outcomes will include:

- Advancement of ecologically-based participatory IPM science, with ecologically-based IPM technologies, information, and systems for managing key pests on important crops in Africa and Asia.
- Improvement of IPM communication, increase in capacity of host-country scientific and outreach institutions, enhancement of ability of practitioners to manage IPM knowledge, and fostering of widespread adoption of ecologically-based IPM technologies, practices, and systems, with measurable impacts.
- Sound economic analysis of all IPM technologies introduced.
- Sound ecological analysis i.e., intervention effects on beneficial microorganisms and other micro-flora, including how suggested interventions will over time, improve yields and preserve environmental integrity.
- Increased capacity of national institutions to reform and strengthen policies that influence pest management.
- Development of sustainable, resource-based local enterprises and their integration into regional, national, and international markets.

The overall purpose of the **IPM for Exportable Fruit Crops in Vietnam** project will be to accomplish these objectives and achieve the key IPM outcomes for exportable fruits from Vietnam to the U.S.A. Specific activities will include pest diagnosis and prioritization, development and validation of IPM component technologies and packages, outreach and scaling up of IPM; and impact evaluation of IPM technologies on gender, income, and the environment. Favorable consideration will be given to activities that involve significant scaling up of existing successful technologies in addition to the development of new technologies. A portion of the budget may be reserved for activities in support of areas identified through the IPM IL research sub-award competition. Such activities would necessarily be described after the sub-awardee is selected and that process will take place after the successful application is selected. To facilitate the development of sustainable IPM packages, a strong representation of entomology, plant pathology, weed science, agricultural economics, and gender analysis is encouraged in the project.

Applicants must demonstrate the ability to propose a conceptual approach for an IPM fruit activity, which works for Vietnamese fruit farmers under Vietnamese conditions. Local knowledge of Vietnamese government, social, and business structure must be demonstrated, as well as Vietnamese fruit farming activities related to export demand. The ability to build a consortium-based research activity around strong partnerships between local universities, government, and the private sector – in the Vietnamese context – is required.

#### **4. Capacity Building**

The project should include human and institutional capacity development at both the scientist and institutional levels. Details regarding the number of trainees, disciplines, location of training, and efforts to ensure gender parity of trainees, as well as the need for training of host country nationals, should be described in the concept note. Collaboration with host country universities is encouraged and may include curriculum development, academic support consistent with research programming, short courses, and other activities that support improved institutional capacity.

Outreach activities aimed at the end-user are required for all projects. These activities can occur via direct contact with end-users by project investigators or through third party organizations such as host country extension services, host country universities, NGOs (non-governmental organizations), and NARS (National Agricultural Research Systems). Use of mass media (radio, TV, newspapers), internet, cell phones, E-Readers, on farm training, workshops and demonstration plots, for technology dissemination and scaling up is encouraged.

#### **5. Gender**

USAID policy requires that gender issues be addressed as appropriate for all USAID-funded activities and that gender differences and inequalities be integrated into the consortium activities and project design. The application must present a gender analysis which discusses important gender issues relevant to appropriate IPM research, development and extension activities. The application must explain how gender considerations and equality issues will be integrated into the design, implementation, management, knowledge sharing, capacity building, and monitoring and evaluation of the overall consortium activities and individual projects.

#### **6. Project Design and Evaluation**

The project must describe a results framework, including monitoring and evaluation, that is consistent with the overall objectives of the IPM IL supporting research, knowledge sharing, and capacity building in relation to small-holder farming systems and the ability to increase ecological intensification for the production of food. The framework must also support national objectives (such as the National IPM Program) and will be part of the overall IPM IL Monitoring and Evaluation procedures.

The project must be in compliance with USAID's Environmental Compliance Procedures described in Title 22 of the Code of Federal Regulations, Part 216 (22 CFR 216 [http://www.usaid.gov/our\\_work/environment/compliance/22cfr216](http://www.usaid.gov/our_work/environment/compliance/22cfr216)) and provide evidence of compliance with all relevant financial accounting procedures, regulatory compliance, responsible conduct of research, and the US Agricultural Terrorism Act of 2002.

#### **7. Project Reporting**

An annual work plan, budget, semiannual activity report summarizing results, impact analysis and results, trip reports, and research reports and summaries will be part of the reporting requirements. The IPM IL staff, USAID staff, and IPM IL technical advisory committee will review and provide feedback. Amendments or changes may be suggested during the annual review with respect to program and budget. Funding for the overall IPM IL budget, and hence for the subcontracts, is allocated on an annual basis. The project should have contingency plans in place for a 10% cut in funding to demonstrate abilities to achieve outcomes under an uncertain Federal fiscal environment.

## **8. Concept Note Information**

### **Eligibility**

US universities as defined under Section 296 (d) of Title XII of the Foreign Assistance Act, CGIAR centers, and host country institutions are eligible to apply as the lead institution for a period of 4.5 years. IPM IL will subcontract with the selected institution, which will then subcontract with collaborating organizations, at least one of which must include a U.S. university if not led by one. The institution making the application will be responsible for negotiating into sub-agreements with all collaborating organizations and for accounting to the Virginia Tech IPM IL Management Entity for all program accomplishments, expenditures, and reporting requirements. The concept note should identify the nature of any collaborations, the distribution of labor and activities between collaborating organizations, and the budget allocations among collaborating organizations.

The IPM IL strongly encourages concept notes from, or for concept notes to include, qualified Minority Serving Institutions. These include, but are not limited to, Historically Black Colleges and Universities, Predominantly Black Institutions, Hispanic Serving Institutions, Tribal Colleges and Universities, and Asian American, Native Alaskan and Pacific Islander Serving Institutions.

### **Importance of Human Resource and Institutional Capacity Development**

Human and institutional capacity building (HICD) are core objectives and concept notes should indicate how this will be strengthened. There should be a demonstration of meaningful collaboration in research and training between a Lead institution and one or more Host Country institutions (public research institutions, universities, NGOs, etc.). Other partners such as U.S. universities and public and private sector research institutions (CGIAR, International agencies etc.) may also be subcontracted. Collaboration with multiple host country institutions is encouraged.

### **Project Funding, Budget Guidelines, and Cost Sharing**

Approximately US\$ 0.8 million is available through November 16, 2019 for the project. The concept note must contain a summary budget with projects and subcontracts clearly delineated using the budget template. Applicants are required to provide non-federal cost sharing which equals or exceeds any overhead earned on host country subawards. Favorable consideration will be given to proposals that further leverage consortium funding. At least 50% of the proposed budget should be spent to support in-country activities. Travel costs for host and U.S. scientists should be included and explained.

### **Format and Evaluation of Concept Notes**

Concept notes must be in English with narrative portions prepared in MS Word with Times New Roman font size 11 and 1.15 line spacing. The summary budget tables must be prepared in Microsoft Excel

utilizing the attached template. Page size should be 8 ½ x 11” with 1” margins. Table 2 lists the guidelines for submission of concept notes.

<b>Table 2. Guideline for submission.</b>	
<b>Component</b>	<b>Description</b>
Title Page	Title; name, institution address, email, phone, and fax for lead PI at lead institution; lists members, total project budget, timeframe, and funds requested from IPM IL.
Executive Summary	Maximum one page
Narrative Description	Describes the project membership with clearly identified roles and responsibilities of all members. Focal topics and geographic areas, IPM components and packages, and research needs should be clearly articulated. Barriers to adoption of IPM components and strategies to overcome them should be identified. Opportunities for supporting research sub-award projects, capacity building, knowledge sharing, and strategies for addressing gender issues should be described. Provide a management and staffing plan.
Anticipated Results	Provide a narrative description referring to the results framework with clear indicators of measuring project results.
Expected Impacts	Describe expected impacts and how they will be measured.
Activity Plan	Provide a timeline of activities over the 4.5-year life of the project
Budget	Provide a summary budget sheet and for the project lead institution and all project members that will receive funding. The format specified by IPM IL must be used.
Budget Justification	Provide a one-page justification/explanation of budget expenditures.
References	List references used in the concept note narrative
PI Qualifications	In one page, provide a description of the qualifications of the PI at the project lead institution and for all relevant members in the project.
Curricula Vitae	Provide the CV for each PI/collaborator whose participation is described in the concept note.

**Page length and order of sections**-The total page length of the concept note, excluding title page, one-page summary budget, one-page budget justification, reference list, PI qualifications, and CVs, is 6 pages. Assemble all sections of the concept note into a single file and convert to a single pdf file for submission. The sections should appear in the following order: 1) title page, 2) executive summary, 3) narrative description, 4) anticipated results, 5) expected impacts, 6) activity plan, 7) budget, 8) budget justification, 9) references, 10) PI qualifications, and 11) relevant CVs.

## 9. Selection Process

An independent Technical Advisory Committee will review and score all proposals according to the following criteria (Table 3). Input may be sought from ad hoc reviewers, host country institutions, USAID Missions, and other relevant development organizations in making the final selection.

<b>Table 3. Criteria used for the evaluation of concept notes</b>	
<b>Criteria</b>	<b>Weight</b>
Technical Merit, Including Management and Staffing	30%
Alignment with Target Country Research Priorities, IPM IL Goals and Objectives	20%
Knowledge Sharing and Outreach Activities	10%
Human and Institutional Capacity Development	10%
Gender programming	10%
Monitoring and Evaluation Activities	10%
Past Performance	10%

## 10. Submission of concept notes

**Questions** pertaining to concept notes should be sent to Dr. R. Muniappan, email: [rmuni@vt.edu](mailto:rmuni@vt.edu) by 11:59 pm Eastern Time on January 9, 2015.

**Concept notes should be submitted** to Dr. R. Muniappan, email: [rmuni@vt.edu](mailto:rmuni@vt.edu) by 11:59 pm Eastern Time on January 30, 2015.

### Selected References

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Waite, G.K. and J.S. Hwang. 2002. Pests of litchi and longan. *In*, J.E. Peña, J.L. Sharp and M. Wysoki (eds.). Tropical Fruit Pests and Pollinators: Biology, Economic Importance, Natural Enemies and Control. CABI Publishing. pp 331-359.

Waterhouse, D.F. 1993. The Major Arthropod Pests and Weeds of Agriculture in Southeast Asia. ACIAR, Canberra, Australia, 141 p.

### III. Concept Note Request for **Modeling for Biodiversity and Climate Change**

#### **Feed the Future Innovation Lab for Integrated Pest Management**



#### **Request for Concept Note**

#### *Modeling for Biodiversity and Climate Change*

Table 1. Calendar of activities.

Activity	Date
Issuance of request for concept note	January 28, 2015
Deadline for questions	February 6, 2015
Deadline for receipt of concept notes	March 13, 2015
Review and selection of concept notes for promotion to full proposals	March 27, 2015
Requests for full proposals sent	April 3, 2015
Deadline for submission of full proposal	May 8, 2015
Proposal winner announced	May 29, 2015

This request for concept notes is issued by Virginia Tech, the Management Entity of the Feed the Future Innovation Lab for Collaborative Research on Integrated Pest Management (IPM IL). The Virginia Tech IPM IL is funded by the U.S. Agency for International Development under cooperative agreement AID-OOA-L-15-00001. The Virginia Tech IPM IL management entity offices are located at the Office of International Research, Education and Development, Virginia Tech, 526 Prices Fork Road, Blacksburg, VA 24061. For additional information please contact Dr. R. Muniappan, IPM IL Director, 540-231-3516, Email: <[rmuni@vt.edu](mailto:rmuni@vt.edu)> Website: <<http://www.oired.vt.edu/ipmcrsp/>>

## 1. Background

The **Feed the Future (FtF) Innovation Lab for Integrated Pest Management (IPM IL)** is a USAID-funded program that supports Integrated Pest Management Research, technology transfer and capacity building in relation to small-holder farming systems. Virginia Tech was awarded a five-year contract on November 25, 2014 to serve as the management entity of the IPM IL. The IPM IL is now inviting the submission of concept notes for modeling biodiversity and climate change in Nepal. Project activities may be proposed for four and one-half years (June 1, 2015 to October 31, November 16, 2019). Following evaluation of the concept notes, full proposals will be requested from a short-list of applicant(s).

Crop losses due to pests (insects, diseases, weeds, nematodes, birds, and rodents) are a major constraint to alleviating poverty and improving nutrition in Asia. Most estimates of production and post-harvest losses due to pests range from 30 to 40 percent. Improper use of pesticides poses a serious threat to health and biodiversity. IPM is a decision support system that uses evidence-based information to reduce losses due to pests, minimize reliance on synthetic pesticides, and foster the long-term sustainability of agricultural systems.

Integrated Pest Management (IPM) is defined as a dynamic, crop, location, and season specific program that combines all available compatible tactics that impart profit, safeguards environmental and human health, encompasses cultural sensitivities, and ensures social acceptance. Biodiversity is an integral part of IPM. Conservation biological control, a major component of IPM is the major protector and enhancer of biodiversity in the agricultural ecosystem. Climate change and subsequent global warming is causing changes in agricultural system and biodiversity. Very few empirical studies have been carried out to document effect of climate change on biodiversity and changes in biodiversity to document climate change. Nepal represents a diversity of climatic regimes within a distance of 200 km, a diversity found from the Florida Keys to Arctic, making it an ideal country to conduct spatio-temporal changes in climate and in turn biodiversity.

Applicants are referred to the IPM IL website for additional information about the IPM IL:  
<http://www.oired.vt.edu/ipmcrsp>

The new IPM IL will develop, implement, and scale up IPM packages for selected crops. Biodiversity and climate change play a critical role in IPM. To understand changes in biodiversity as a result of climate change and to empirically document it, USAID has requested, as part of the overall program, a project on modeling for biodiversity and climate change.



## **2. Overview**

The IPM IL invites the submission of a concept note from US universities, CGIAR institutions, and host country research institutions that may lead to an invitation to submit a concept note to lead the project on Modeling for Biodiversity and Climate Change to be implemented in Nepal. Some illustrative institutions and universities for collaboration would be: Bioversity, CABI, National Agricultural Research Council, Tribhuvan University, iDE, and NGOs in Nepal.

The project will:

- a. Spatio-temporally assess biodiversity by laying transects at every 200 m elevation starting from 200 m from sea level at Terai to about 3,000 m in the Himalayas in Nepal.
- b. Conduct biodiversity surveys including soil invertebrates, above ground arthropods, and flora by laying transects at different altitudes, analyze, and interpret data.
- c. Set up weather stations at the transect locations.
- d. Build institutional and human capacity in Nepal.
- e. Include economic and gender impact evaluations in the project.

## **3. Research and Activity Priorities**

The overall IPM IL has four program objectives:

Advance IPM science, and develop IPM technologies, information, and systems for sound sustainable intensification;

- Improve IPM communication and education, and the ability of the practitioners to manage knowledge, resulting in widespread adaptation, adoption, and impact of ecologically-based IPM technologies, practices and systems;
- Provide information and capacity building to reform and strengthen policies and national institutions that influence pest management; and
- Develop and integrate sustainable resource-based local enterprises into national regional and global markets.

In order to accomplish these program objectives, the IPM IL activities for this Sub-Award will include:

- Identify and describe the technical factors affecting pest management;
- Identify and describe the social, economic, political, and institutional factors affecting pest management;
- Work with collaborating groups to design, test, evaluate, and disseminate appropriate participatory IPM technologies, packages, and strategies;
- Work with collaborating groups to promote training and information exchange on participatory IPM;
- Work with collaborating groups to foster needed policy and institutional changes.

Key IPM outcomes will include:

- Advancement of ecologically-based participatory IPM science, with ecologically-based IPM technologies, information, and systems for managing key pests on important crops in Africa and Asia.
- Improvement of IPM communication, increase in capacity of host-country scientific and outreach institutions, enhancement of ability of practitioners to manage IPM knowledge, and fostering of widespread adoption of ecologically-based IPM technologies, practices, and systems, with measurable impacts.
- Increased capacity of national institutions to reform and strengthen policies that influence pest management.
- Development of sustainable, resource-based local enterprises and their integration into regional, national, and international markets.

The overall purpose of **Modeling for Biodiversity and Climate Change** project is to model climate change and its effect on biodiversity by assessing biodiversity of soil invertebrates, above ground arthropods, and flora in a series of transects laid from Terai to about 3,000 m in the Himalayas at constant intervals for a duration of four and half years. Warming is expected to be greatest over land and at the most in high northern altitudes. Climate change could lead to an increase in abundance and diversity of pests as habitats become more favorable to them. Existing interactions in disturbed and new niches become favorable for invasive species. Empirical recording of changes in climate and resultant changes in biodiversity is expected.

Favorable consideration will be given to activities that involve scientists from developing countries. A portion of the budget may be reserved for activities in support of areas identified through the IPM IL research sub-award competition. Such activities would necessarily be described after the sub-awardee is selected and that process will take place after the successful application is selected. To facilitate the development of models, a strong representation of entomology, biology, ecology, climatology, network dynamics and simulation, and gender is encouraged in the project.

Applicants must demonstrate the ability to propose a conceptual approach for modeling climate change and biodiversity. Familiarity with geo-spatial modeling encompassing diversity of soil invertebrates, above ground arthropods and flora is required.

#### **4. Capacity Building**

The project should include human and institutional capacity development at both the scientist and institutional levels. Details regarding the number of trainees, disciplines, location of training, and efforts to ensure gender parity of trainees, as well as the need for training of host country nationals, should be described in the concept note. Collaboration with host country universities is encouraged and may include curriculum development, academic support consistent with research programming, short courses, and other activities that support improved institutional capacity.

Outreach activities aimed at the end-user are required for all projects. These activities can occur via direct contact with end-users by project investigators or through third party organizations such as host country extension services, host country universities, NGOs (non-governmental organizations), and NARS (National Agricultural Research Systems). Use of mass media (radio, TV, newspapers), internet, cell phones, E-Readers, workshops and demonstrations, for technology dissemination and scaling up is encouraged.

## **5. Gender**

USAID policy requires that gender issues be addressed as appropriate for all USAID-funded activities and that gender differences and inequalities be integrated into the consortium activities and project design. The application must present a gender analysis which discusses important gender issues relevant to appropriate IPM research, development and extension activities. The application must explain how gender considerations and equality issues will be integrated into the design, implementation, management, knowledge sharing, capacity building, and monitoring and evaluation of the overall consortium activities and individual projects.

## **6. Project Design and Evaluation**

The project must describe a results framework, including monitoring and evaluation, that is consistent with the overall objectives of the IPM IL supporting research, knowledge sharing, and capacity building in relation to small-holder farming systems and the ability to increase ecological intensification for the production of food. The framework must also support national objectives (such as the National IPM Program) and will be part of the overall IPM IL Monitoring and Evaluation procedures.

The project must be in compliance with USAID's Environmental Compliance Procedures described in Title 22 of the Code of Federal Regulations, Part 216 (22 CFR 216 [http://www.usaid.gov/our\\_work/environment/compliance/22cfr216](http://www.usaid.gov/our_work/environment/compliance/22cfr216)) and provide evidence of compliance with all relevant financial accounting procedures, regulatory compliance, responsible conduct of research, and the US Agricultural Terrorism Act of 2002.

## **7. Project Reporting**

An annual work plan, budget, semiannual activity report summarizing results, impact analysis and results, trip reports, and research reports and summaries will be part of the reporting requirements. The IPM IL staff, USAID staff, and IPM IL technical advisory committee will review and provide feedback. Amendments or changes may be suggested during the annual review with respect to program and budget. Funding for the overall IPM IL budget, and hence for the subcontracts, is allocated on an annual basis. The project should have contingency plans in place for a 10% cut in funding to demonstrate abilities to achieve outcomes under an uncertain Federal fiscal environment.

## **8. Concept Note Information**

### **Eligibility**

US universities as defined under Section 296 (d) of Title XII of the Foreign Assistance Act, CGIAR centers, and host country institutions are eligible to apply as the lead institution for a period of 4.5 years. IPM IL will subcontract with the selected institution, which will then subcontract with collaborating

organizations, at least one of which must include a U.S. university if not led by one. The institution making the application will be responsible for negotiating into sub-agreements with all collaborating organizations and for accounting to the Virginia Tech IPM IL Management Entity for all program accomplishments, expenditures, and reporting requirements. The concept note should identify the nature of any collaborations, the distribution of labor and activities between collaborating organizations, and the budget allocations among collaborating organizations.

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**Importance of Human Resource and Institutional Capacity Development**

Human and institutional capacity building (HICD) are core objectives and concept notes should indicate how this will be strengthened. There should be a demonstration of meaningful collaboration in research and training between a Lead institution and one or more Host Country institutions (public research institutions, universities, NGOs, etc.). Other partners such as U.S. universities and public and private sector research institutions (CGIAR, International agencies etc.) may also be subcontracted.

**Project Funding, Budget Guidelines, and Cost Sharing**

Approximately US\$ 0.8 million is available through November 16, 2019 for the project. The concept note must contain a summary budget with projects and subcontracts clearly delineated using the attached template. Applicants are required to provide non-federal cost sharing which equals or exceeds any overhead earned on host country sub-awards. Favorable consideration will be given to proposals that further leverage project funding. At least 50% of the proposed budget should be spent to support host country activities. Travel costs for host and U.S. scientists should be included and explained.

**Format and Evaluation of Concept Notes**

Concept notes must be in English with narrative portions prepared in MS Word with Times New Roman font size 11 and 1.15 line spacing. The summary budget tables must be prepared in Microsoft Excel utilizing the attached template. Page size should be 8 ½ x 11” with 1” margins. Table 2 lists the guidelines for submission of concept notes.

<b>Table 2. Guideline for submission.</b>	
<b>Component</b>	<b>Description</b>
Title Page	Title; name, institution address, email, phone, and fax for lead PI at lead institution; lists members, total project budget, timeframe, and funds requested from IPM IL.
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Narrative Description	Describes the project membership with clearly identified roles and responsibilities of all members. Focal topics and geographic areas, IPM components and packages, and research needs should be clearly articulated. Barriers to adoption of IPM components and strategies to overcome them should be identified. Opportunities for supporting research sub-award projects, capacity building, knowledge sharing, and strategies for addressing gender issues should be described. Provide a management and staffing plan.
Anticipated Results	Provide a narrative description referring to the results framework with clear indicators of measuring project results.

Expected Impacts	Describe expected impacts and how they will be measured.
Activity Plan	Provide a timeline of activities over the 4.5-year life of the project
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Budget Justification	Provide a one-page justification/explanation of budget expenditures.
References	List references used in the concept note narrative
PI Qualifications	In one page, provide a description of the qualifications of the PI at the project lead institution and for all relevant members in the project.
Curricula Vitae	Provide the CV for each PI/collaborator whose participation is described in the concept note.

**Page length and order of sections**-The total page length of the concept note, excluding title page, one-page summary budget, one-page budget justification, reference list, PI qualifications, and CVs, is 6 pages. Assemble all sections of the concept note into a single file and convert to a single pdf file for submission. The sections should appear in the following order: 1) title page, 2) executive summary, 3) narrative description, 4) anticipated results, 5) expected impacts, 6) activity plan, 7) budget, 8) budget justification, 9) references, 10) PI qualifications, and 11) relevant CVs.

## 9. Selection Process

An independent Technical Advisory Committee will review and score all proposals according to the following criteria (Table 3). Input may be sought from ad hoc reviewers, host country institutions, USAID Missions, and other relevant development organizations in making the final selection.

**Table 3. Criteria used for the evaluation of concept notes**

Criteria	Weight
Technical Merit, Including Management and Staffing	30%
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Knowledge Sharing and Outreach Activities	10%
Human and Institutional Capacity Development	10%
Gender programming	10%
Monitoring and Evaluation Activities	10%
Past Performance	10%

## 10. Submission of concept notes

**Questions** pertaining to concept notes should be sent to Dr. R. Muniappan, email: [rmuni@vt.edu](mailto:rmuni@vt.edu) by 11:59 pm Eastern Time on February 6 2015.

**Concept notes should be submitted** to Dr. R. Muniappan, email: [rmuni@vt.edu](mailto:rmuni@vt.edu) by 11:59 pm Eastern Time on March 13, 2015.

### **Selected References**

Kindlmann, P. 2012. Himalayan Biodiversity in the Changing world. Springer 226 p.

Cock, M.J.W., J.C. Biesmeijer, R.J.C. Cannon, P.J. Gerard, D. Gillespie, J.J. Jimenez, P.M. Lavelle and S.K. Raina. 2013. The implications of climate change for positive contributions of invertebrates to world agriculture. CAB Reviews 8 (028) 50 p.

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[http://community.eldis.org/.5b9bfce3/Integrated%20ARCC%20Compendium\\_CLEARED.pdf](http://community.eldis.org/.5b9bfce3/Integrated%20ARCC%20Compendium_CLEARED.pdf)

IV. Concept Note Request for **Invasive Species – Modeling for South American tomato leafminer, *Tuta absoluta* and Groundnut leafminer, *Aproaerema modicella (simplexella)***

A draft RFA for this concept note request has been submitted to the AOR for approval.

**Feed the Future Innovation Lab for Integrated Pest Management**



**Request for Concept Note**

*Invasive Species – Modeling for South American tomato leafminer, *Tuta absoluta* and Groundnut leafminer, *Aproaerema modicella (simplexella)**

Table 1. Calendar of activities.	
Activity	Date
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## 1. Background

The **Feed the Future (FtF) Innovation Lab for Integrated Pest Management (IPM IL)** is a USAID-funded program that supports Integrated Pest Management Research, technology transfer and capacity building in relation to small-holder farming systems. Virginia Tech was awarded a five-year contract on November 25, 2014 to serve as the management entity of the IPM IL. The IPM IL is now inviting the submission of concept notes designed to develop and implement sustainable IPM strategies for exportable fruit crops in Vietnam through a process of technology development and large-scale transfer combined with human and institutional capacity building activities. Project activities may be proposed for four and one-half years (June 1, 2015 to October 31, November 16, 2019). Following evaluation of the concept notes, full proposals will be requested from a short-list of applicant(s).

Crop losses due to pests (insects, diseases, weeds, nematodes, birds, and rodents) are a major constraint to alleviating poverty and improving nutrition in Asia. Most estimates of production and post-harvest losses due to pests range from 30 to 40 percent. Improper use of pesticides poses a serious threat to health and biodiversity. IPM is a decision support system that uses evidence-based information to reduce losses due to pests, minimize reliance on synthetic pesticides, and foster the long-term sustainability of agricultural systems.

Integrated Pest Management (IPM) is defined as a dynamic, crop, location, and season specific program that combines all available compatible tactics that impart profit, safeguards environmental and human health, encompasses cultural sensitivities, and ensures social acceptance. The IPM IL in the previous phase identified several invasive species including arthropods, plants, nematodes, fungi, bacteria, viruses, and others. The spread of invasive species is one of the greatest threats to ecological and agricultural well-being of the earth. Invasives cost the U.S. as much as \$120 billion a year in damages and the U.S. government spent \$2.2 billion in 2012 trying to prevent, control and sometimes eradicate them. The South American tomato leafminer introduced accidentally to Spain in 2006 has already invaded European, Mediterranean and Middle Eastern countries and recently reached Senegal and Gambia in West Africa and Ethiopia, Kenya, and Tanzania in East Africa. It also has spread to Panama and Costa Rica in Central America. Because this pest is of quarantine importance as well as a serious threat to tomato production, the U.S.A and countries in Africa, Asia and Central and North America are concerned about its possible invasion. The groundnut leaf miner was also accidentally introduced to Uganda from Asia in 1996. Since then it has spread to most of the Eastern and Southern Africa. The threat is real that it will invade rest of Africa in the near future.

Applicants are referred to the IPM IL website for additional information about the IPM IL: <http://www.oired.vt.edu/ipmcrsp>



The new IPM IL will develop, implement, and scale up IPM packages for selected crops and address invasive species. USAID has requested, as part of the overall program, an Invasive Species – Modeling the spread of South American Tomato Leafminer, *Tuta absoluta* (Lepidoptera: Gelechiidae) and Groundnut Leafminer, *Aproaerema modicella (simplexella)* (Lepidoptera: Gelechiidae) in Asia and Africa.

## 2. Overview

The IPM IL invites the submission of a concept note from US universities, CGIAR institutions, and host country research institutions that may lead to an invitation to submit a full proposal to lead the project on Invasive Species – Modeling for South American Tomato Leafminer, *Tuta absoluta* and Groundnut Leafminer, *Aproaerema modicella (simplexella)*. Some illustrative institutions and universities for collaboration would be: Peanut and Mycotoxin Innovation Lab, Horticulture Innovation Lab, USDA-APHIS, CABI, AVRDC, *icipe*, ICRISAT, IITA, CIP, ASARECA, National Agricultural Research Institutes and Universities in the U.S.A., Africa, Asia, Australia and Europe, Russell IPM, ISCA, BCRL, and others.

The project will:

- a) Develop universal models for prediction of spread of groundnut leafminer and South American tomato leafminer in the next 5, 10 and 15 years.
- b) Include geo-spatial technologies taking into consideration biology, life tables, host plants, natural enemies, and other biotic factors.
- c) Inform countries yet to be invaded by these insects of the impending danger of invasion and recommend appropriate regulatory and control measures.
- d) Involve appropriate host countries in the institutional and human capacity building.
- e) Plan and conduct economic and gender impact evaluations of the project.

## 3. Research and Activity Priorities

- Advance IPM science, and develop IPM technologies, information, and systems for sound sustainable intensification;
- Improve IPM communication and education, and the ability of the practitioners to manage knowledge, resulting in widespread adaptation, adoption, and impact of ecologically-based IPM technologies, practices and systems;
- Provide information and capacity building to reform and strengthen policies and national institutions that influence pest management; and
- Develop and integrate sustainable resource-based local enterprises into national regional and global markets.

In order to accomplish these program objectives, this sub-award will:

- Identify and describe the technical factors influencing the spread of invasive species;

- Identify and describe the social, economic, geo-political, and institutional factors influencing the spread of invasive species;
- Work with collaborating groups to design, test, evaluate, and identify spatio-temporal spread of the two invasive species;
- Work with collaborating groups to promote training and information exchange;
- Work with collaborating groups to foster needed policy and institutional changes.

The overall purpose of the **Invasive Species – Modeling for South American tomato leafminer, *Tuta absoluta* and Groundnut leafminer, *Aproaerema modicella (simplexella)*** project is to model the spread of the two invasive insect species namely, groundnut leafminer and South American tomato leafminer. Specific activities will include identification of groundnut leafminer species in East Africa, possible sources of their/its introduction and possible spatio-temporal nature of spread in the rest of Africa. The model for the South American tomato leafminer should include prediction of its spread in Europe, Africa, Asia, and Central and North America. Favorable consideration will be given to activities that involve scientists from developing countries. A portion of the budget may be reserved for activities in support of areas identified through the IPM IL research sub-award competition. Such activities would necessarily be described after the sub-awardee is selected and that process will take place after the successful application is selected. To facilitate the development of models, a strong representation of entomology, network dynamics and simulation, agricultural economics, and gender analysis is encouraged in the project.

Applicants must demonstrate the ability to propose a conceptual approach for modeling invasive insect pests. Familiarity with geo-spatial modeling encompassing insect biology, dispersal, natural enemies, socio-economic factors, local and international transportation, trade, and other related considerations is necessary.

#### **4. Capacity Building**

The project should include human and institutional capacity development at both the scientist and institutional levels. Details regarding the number of trainees, disciplines, location of training, and efforts to ensure gender parity of trainees, as well as the need for training of host country nationals, should be described in the concept note. Collaboration with host country universities is encouraged and may include curriculum development, academic support consistent with research programming, short courses, and other activities that support improved institutional capacity.

Outreach activities aimed at the end-user are required for all projects. These activities can occur via direct contact with end-users by project investigators or through third party organizations such as host country extension services, host country universities, NGOs (non-governmental organizations), and NARS (National Agricultural Research Systems). Use of mass media (radio, TV, newspapers), internet, cell phones, E-Readers, workshops and demonstrations, for technology dissemination and scaling up is encouraged.

#### **5. Gender**

USAID policy requires that gender issues be addressed as appropriate for all USAID-funded activities and that gender differences and inequalities be integrated into the consortium activities and project design. The application must present a gender analysis which discusses important gender issues relevant to

appropriate IPM research, development and extension activities. The application must explain how gender considerations and equality issues will be integrated into the design, implementation, management, knowledge sharing, capacity building, and monitoring and evaluation of the overall consortium activities and individual projects.

## **6. Project Design and Evaluation**

The project must describe a results framework, including monitoring and evaluation, that is consistent with the overall objectives of the IPM IL supporting research, knowledge sharing, and capacity building in relation to small-holder farming systems and the ability to increase ecological intensification for the production of food. The framework must also support national objectives (such as the National IPM Program) and will be part of the overall IPM IL Monitoring and Evaluation procedures.

The project must be in compliance with USAID's Environmental Compliance Procedures described in Title 22 of the Code of Federal Regulations, Part 216 (22 CFR 216 [http://www.usaid.gov/our\\_work/environment/compliance/22cfr216](http://www.usaid.gov/our_work/environment/compliance/22cfr216)) and provide evidence of compliance with all relevant financial accounting procedures, regulatory compliance, responsible conduct of research, and the US Agricultural Terrorism Act of 2002.

## **7. Project Reporting**

An annual work plan, budget, semiannual activity report summarizing results, impact analysis and results, trip reports, and research reports and summaries will be part of the reporting requirements. The IPM IL staff, USAID staff, and IPM IL technical advisory committee will review and provide feedback. Amendments or changes may be suggested during the annual review with respect to program and budget. Funding for the overall IPM IL budget, and hence for the subcontracts, is allocated on an annual basis. The project should have contingency plans in place for a 10% cut in funding to demonstrate abilities to achieve outcomes under an uncertain Federal fiscal environment.

## **8. Concept Note Information**

### **Eligibility**

US universities as defined under Section 296 (d) of Title XII of the Foreign Assistance Act, CGIAR centers, and host country institutions are eligible to apply as the lead institution for a period of 4.5 years. IPM IL will subcontract with the selected institution, which will then subcontract with collaborating organizations, at least one of which must include a U.S. university if not led by one. The institution making the application will be responsible for negotiating into sub-agreements with all collaborating organizations and for accounting to the Virginia Tech IPM IL Management Entity for all program accomplishments, expenditures, and reporting requirements. The concept note should identify the nature of any collaborations, the distribution of labor and activities between collaborating organizations, and the budget allocations among collaborating organizations.

The IPM IL strongly encourages concept notes from, or for concept notes to include, qualified Minority Serving Institutions. These include, but are not limited to, Historically Black Colleges and Universities, Predominantly Black Institutions, Hispanic Serving Institutions, Tribal Colleges and Universities, and Asian American, Native Alaskan and Pacific Islander Serving Institutions.

### **Importance of Human Resource and Institutional Capacity Development**

Human and institutional capacity building (HICD) are core objectives and concept notes should indicate how this will be strengthened. There should be a demonstration of meaningful collaboration in research and training between a Lead institution and one or more Host Country institutions (public research

institutions, universities, NGOs, etc.). Other partners such as U.S. universities and public and private sector research institutions (CGIAR, International agencies etc.) may also be subcontracted.

### **Project Funding, Budget Guidelines, and Cost Sharing**

Approximately US\$ 0.75 million is available through November 16, 2019 for the project. The concept note must contain a summary budget with projects and subcontracts clearly delineated using the attached template. Applicants are required to provide non-federal cost sharing which equals or exceeds any overhead earned on host country sub-awards. Favorable consideration will be given to proposals that further leverage project funding. At least 50% of the proposed budget should be spent to support host country activities. Travel costs for host and U.S. scientists should be included and explained.

### **Format and Evaluation of Concept Notes**

Concept notes must be in English with narrative portions prepared in MS Word with Times New Roman font size 11 and 1.15 line spacing. The summary budget tables must be prepared in Microsoft Excel utilizing the attached template. Page size should be 8 ½ x 11” with 1” margins. Table 2 lists the guidelines for submission of concept notes.

<b>Table 2. Guideline for submission.</b>	
<b>Component</b>	<b>Description</b>
Title Page	Title; name, institution address, email, phone, and fax for lead PI at lead institution; lists members, total project budget, timeframe, and funds requested from IPM IL.
Executive Summary	Maximum one page
Narrative Description	Describes the project membership with clearly identified roles and responsibilities of all members. Focal topics and geographic areas, IPM components and packages, and research needs should be clearly articulated. Barriers to adoption of IPM components and strategies to overcome them should be identified. Opportunities for supporting research sub-award projects, capacity building, knowledge sharing, and strategies for addressing gender issues should be described. Provide a management and staffing plan.
Anticipated Results	Provide a narrative description referring to the results framework with clear indicators of measuring project results.
Expected Impacts	Describe expected impacts and how they will be measured.
Activity Plan	Provide a timeline of activities over the 4.5-year life of the project
Budget	Provide a summary budget sheet and for the project lead institution and all project members that will receive funding. The format specified by IPM IL must be used.
Budget Justification	Provide a one-page justification/explanation of budget expenditures.
References	List references used in the concept note narrative
PI Qualifications	In one page, provide a description of the qualifications of the PI at the project lead institution and for all relevant members in the project.
Curricula Vitae	Provide the CV for each PI/collaborator whose participation is described in the concept note.

**Page length and order of sections**-The total page length of the concept note, excluding title page, one-page summary budget, one-page budget justification, reference list, PI qualifications, and CVs, is 6 pages. Assemble all sections of the concept note into a single file and convert to a single pdf file for submission. The sections should appear in the following order: 1) title page, 2) executive summary, 3) narrative description, 4) anticipated results, 5) expected impacts, 6) activity plan, 7) budget, 8) budget justification, 9) references, 10) PI qualifications, and 11) relevant CVs.

## 9. Selection Process

An independent Technical Advisory Committee will review and score all proposals according to the following criteria (Table 3). Input may be sought from ad hoc reviewers, host country institutions, USAID Missions, and other relevant development organizations in making the final selection.

<b>Table 3. Criteria used for the evaluation of concept notes</b>	
<b>Criteria</b>	<b>Weight</b>
Technical Merit, Including Management and Staffing	30%
Alignment with Target Country Research Priorities, IPM IL Goals and Objectives	20%
Knowledge Sharing and Outreach Activities	10%
Human and Institutional Capacity Development	10%
Gender programming	10%
Monitoring and Evaluation Activities	10%
Past Performance	10%

## 10. Submission of concept notes

**Questions** pertaining to concept notes should be sent to Dr. R. Muniappan, email: [rmuni@vt.edu](mailto:rmuni@vt.edu) by 11:59 pm Eastern Time on February 6 2015.

**Concept notes should be submitted** to Dr. R. Muniappan, email: [rmuni@vt.edu](mailto:rmuni@vt.edu) by 11:59 pm Eastern Time on March 13, 2015.

## Selected References

### 1. *Aproaerema modicella (simplexella)*

Buthelezi, N.M., D.E. Conlong and G.E. Zharare. 2012. The groundnut leaf miner collected from South Africa is identified by mtDNA CO1 gene analysis as the Australian soybean moth (*Aproaerema simplexella*) (Walker) (Lepidoptera: Gelechiidae). African Journal of Agricultural Research 7: 5285-5292.

Buthelezi, N.M., D.E. Conlong and G.E. Zharare. 2013. A comparison of the infestation of *Aproaerema simplexella* (Walker) on groundnut and other known hosts for *Aproaerema modicella* (Deventer) (Lepidoptera: Gelechiidae). African Entomology 21: 183-195.

Du Plessis, H. 2003. First report of groundnut leaf-miner, *Aproaerema modicella* (Deventer) (Lepidoptera: Gelechiidae) on groundnut, soybean and Lucerne in South Africa. South African Journal of Plant and Soil 20: 48.

Page, W.W., G. Espieru, F.M. Kimmins, C. Busolo-Bulafu and P.W. Nalyongo. 2000. Groundnut leaf miner *Approaerema modicella*: a new pest in eastern districts of Uganda. International Arachis Newsletter 20: 64-66.

Shanower, T.G., J.A. Wightman and A.P. Gutierrez. 1993. Biology and control of the groundnut leafminer, *Approaerema modicella* (Deventer) (Lepidoptera: Gelechiidae). Crop Protection 2: 3-10.

Shanower, T.G., J.A. Wightman and A.P. Gutierrez. 1993. Effect of temperature on development rates, fecundity and longevity of the groundnut leafminer, *Approaerema modicella* (Lep.: Gelechiidae), in India. Bulletin of Entomological Research 83: 413-419.

Subrahmanyam, P., A.J. Chiyemberkeza and G.V.R. Rao. 2000. Occurrence of groundnut leaf miner in northern Malawi. International Arachis Newsletter 20: 66-67.

<http://www.plantwise.org/KnowledgeBank/Datasheet.aspx?dsid=6548>

## 2. **Tuta absoluta**

Desneux, N., E. Wajnberg, K.A. Wyckhuys, G. Burgio, S. Arpaia, C.A. Narvaez-Vasquez, j. Gonzalez-Cabrera, D.C. Ruescas, E. Tabone, and J. Vasquez. 2010. Biological invasion of European tomato crops by *Tuta absoluta*: ecology, geographic expansion and prospects for biological control. Journal of pest Science 83: 197-215.

Desneux, N., M.G. Luna, T. Guillemaud, and A. Urbaneja. 2011. The invasive South American tomato pinworm, *Tuta absoluta*, continues to spread in Afro-Eurasia and beyond: the new threat to tomato world production. Journal of Pest Science 84: 403-408.

Pfeiffer, D.G., R. Muniappan, D. Sall, P. Diatta, A. Diongue, and E. O. Dieng. 2013. First Record of *Tuta absoluta* (Lepidoptera: Gelechiidae) in Senegal. Florida Entomologist, 96: 661-662.

Bloem, S. and E. Spaltenstein. 2011. New Pest Response Guidelines – Tomato leafminer (*Tuta absoluta*). USDA-APHIS, Emergency and Domestic Programs

<http://www.oired.vt.edu/ipmcrsp/workshop-tuta-absoluta-meeting-challenge-tomato-leafminer/>

<http://www.tutaabsoluta.com/>

<http://www.cabi.org/isc/datasheet/49260>

<http://www.oired.vt.edu/ipmcrsp/news-events-media/national-stakeholders-symposium-tuta-absoluta-meeting-challenge-tomato-leaf-miner/>

## 3. **Modeling**

Eubank S, Guclu H, Kumar VSA, et al. 2004. Modelling disease outbreaks in realistic urban social networks. *Nature* 429:180.

## V. Visits to USAID Missions in Host Countries.

The Project Director and AOR traveled to Vietnam and Cambodia in December 2014 to meet with the representatives of the USAID missions, Universities, Research Institutes, NGOs and others to gather information for issuing RFAs for sub-awards involving those countries.

Another trip to Kenya and Ethiopia in February 2015 has been planned.

We have plans to visit missions in Burma and Tanzania before issuing the following RFAs.

1. Vegetable crops IPM in Asia
2. Vegetable crops IPM in East Africa
3. Grains IPM in Nepal
4. Grains IPM in East Africa
5. Rice IPM in Burma and Cambodia
6. Using crop diversity as an IPM tool

**We plan to release these RFAs either in late February or early March 2015.**

## VI. Formation of the IPM IL Technical Advisory Committee

A list of candidates and their CVs to be appointed as members of the IPM IL Technical Advisory Committee have been submitted to AOR for his approval.

## VII. Review of Concepts Notes and Selection of Full Proposals

We plan to complete review and selection of concept notes, selection of full proposals and to implement the sub-awards from March to June 2015.

## VIII. Conferences

We will organize a mini-symposium in the 8<sup>th</sup> International IPM Symposium at Salt Lake City, Utah, March 22-27, 2015. Drs. R. Muniappan, Amer Fayad, Naidu Rayapati, Robert Gilbertson and George Norton from the U.S. and Mr. Sulav Paudel from Nepal and Mr. Shahadath Hossain from Bangladesh are expected to attend. The organizing committee has already allocated a two hour slot for this IPM IL symposium.

The 18<sup>th</sup> International Plant Protection Congress (IPPC) ([www.ippc2015.de](http://www.ippc2015.de)) jointly organized by the German Scientific Society for Plant Protection and Plant Health (DPG) and the International Association for the Plant Protection Sciences (IAPPS) will be held in Berlin, Germany, 24-27 August 2015. This Congress, held at four year intervals, is the only International Congress that encompasses all IPM disciplines including plant pathology, weed science, entomology, nematology, vertebrate pests, plant breeding, gender and ag economics plus technology transfer activities, quarantines, pesticide regulations and government policies. The Congress will provide an opportunity to promote the global awareness of the IPM IL, provide an opportunity to network with international agencies such as GIZ, CIRAD, CABI, Bioversity International etc. and provide a venue for the development of global networks on 1) *Tuta absoluta*, 2) Parthenium, 3) Invasive species, 4) Biodiversity and climate change, 5) Rice IPM,

and 6) Tropical vegetable IPM. The Congress will have two sessions organized by the IPM IL: one on “IPM Packages for Vegetables and other Crops” and a second on “Invasive Species – *Tuta absoluta*.” In addition, we are also planning to have an evening workshop on “Food Security: The Role of IPM,” similar to the one we had four years ago in Hawaii. It is requested that R. Muniappan, Amer Fayad, Short Heinrichs and Brhane Gebrekidan are authorized to participate in this congress.



## IX. Travel Matrix for FY 2015

The travel matrix with listing of estimated trips to be taken by the ME and sub-awardees for selection of project topics, implementation of projects, training, and to conduct symposia is given below for approval.

### IPM IL Travel Matrix for FY 2015<sup>1</sup>

Country	ME	Parthenium	Vietnam	Climate Change	Invasive Species	Rice	Vegetables In S/SE Asia	Grains Nepal	East Africa grains	East Africa Vegetables	Crop Diversity as an IPM tool	Total
Vietnam	3		5									8
Cambodia	3					5	5					13
Bangladesh	3						5					8
Nepal	3			5			5	4				17
Burma	3					5						8
Ethiopia	3	6			2				5	5		21
Kenya	3	1			2				5	5		16
Tanzania	3	1			2				5	5		16
USA		1	1	1			1	1	1	1		7
Germany	4											4
Uganda		1			2							3
Costa Rica					2							2
Panama					2							2
Senegal					2							2
Mali					2							2
Malawi	1											1
Rwanda		1										1
Burundi		1										1
Total	29	12	6	6	16	10	16	5	16	16		132

1- No expenses will be incurred over and above the IPM IL FY 2015 budget for the travels listed in this matrix.