Use of Economic Analysis to inform SPS decision-making

Cost Benefit Analysis of the Pink Hibiscus Mealybug Project in Belize

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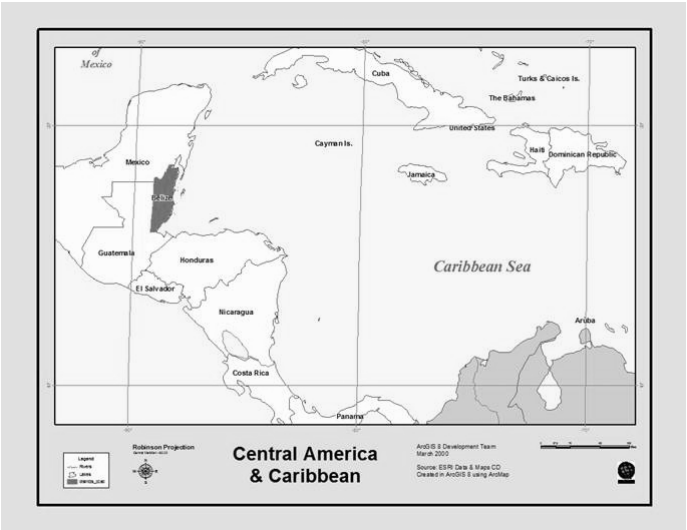
Belize Information



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Antecedent

- The PHMB *Maconellicoccus hirsutus* (Greene) is a polyphagus pest that affects > 250 species of plants
- PHMB first detected in Grenada in 1984
- Damage sustained by the crops can range from 10% to 90 % (IICA)
- Caribbean - Losses ranged from of $3.5 and $125 million annually
- The PHMB has the potential to affect > 200 commodities in 17 countries of the region with a value of US $84.2 billion (IICA)

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Antecedent cont.

- Control measures attempted in the Caribbean were chemical and cultural but were not very effective
- Biological control using parasitic wasp and predatory beetles was successful – 94% control within 2 years
- PHMB would affect agricultural production and trade in Belize - Primary agriculture production in 2007 = $143 million
- Biological control programme initiated in 1999 in Belize

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Cost Benefit Analysis

Purpose

- Justification for continued financing and support
- Scope
  - PHMB programme cost and resulting benefits

Management summary

- Assumptions
  - The impact to the agriculture sector in Belize would be similar to the other Caribbean countries
  - The PHMB programme has prevented the pest from affecting commercial production areas in Belize
  - It has prevented the spread of this pest to other Central American countries
- Constraints
  - Estimating intangibles such as environmental and social impact/benefits difficult

Methodology

- Immediate action by the GOB = $125,000.
- International agencies assistance
  - IICA - $50,000
  - USDA – $125,000
  - CARDI- $25,000.
- Costs included in the c/b analysis
  - field activities- surveillance, surveys, control (biological and manual)
  - Insectary- personnel, materials, equipments etc.
- Use economic extrapolation from real case scenarios of other regional countries and use data from in-country sources (CSO, MAF)

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Quantifiable benefits

- The operational and capital costs of the PHMB programme subtracted from the quantifiable benefits in a dollar value net benefit
- The quantifiable benefits were calculated by comparing the alternative system of "do nothing"
- Estimated losses to agriculture over the life of the project would be the benefit of having a system in place

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Intangible benefits

- Aesthetic value
  - Landscape, eco resorts, social
- No environmental impact
- Benefits to C.A.- protection of US $millions in market access.

Alternatives

Current system	**Alternative system "do nothing"**
• Monthly surveillance • Evaluation of study sites • Parasitoid release if there is resurgence • Insectary	• Heavy reliance on pesticide • High impact on the environment • Economic thresholds overcome • Plant Health unable to provide adequate service • Social impact- backyard fruits • Loss of aesthetic value

Operational costs

Activities	2000	2001	2002	Total
Initiation/planning (analysis) IICA/GOB	$175,000	$175,000		
Design/construction (USDA)	$125,000	$125,000	$54,250	
Implementation (CARDI)	$25,000	$25,000		
Operational costs (OIRSA)	$82,867	$72,867	$38617	$248,603
Total costs	$407,867	$72,867	$92,867	$573,603

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Benefits

- PHMB population decreased by 93.1% after the release of the parasitic wasp
- Protection of commercial production areas
- Barrier for Central America
- Extrapolating from the Grenada experience we can determine how much it would cost Belize if we adopted the “do nothing” alternative.

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Cost reduction

- Insectary- local production of *A. kamali* decreased the cost of the programme significantly

Source	A. kamali	Cost US $	
CABI	150,000	1.80	$270,000
Belize (2002)	150,000	.40	$60,000
Annual savings			$210,000

- *A new insectary was established in 2003 in Belmopan City*
- *Present COP is ~ $0.18*

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Recurring benefits

- To determine the recurring benefits an example is shown below:

Crop	% loss	Value	Net loss
Banana	10	$31,400,000	$3.1 million
Beans	40	$2,521,451	$1.25 million
citrus	15	$57,500,000	$8.5 million
Papaya	40	$5,141,150.	$2.1 million
Hot pepper	25	$331,201.	$82,500.

- $17 million/year in losses x 3 years = $51 million
- Having a programme in place saved $51 million in agricultural production

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Comparative cost/benefit summary- 2000-2002

- Cost of programme = **$568,627.94**
- Averted losses by having a PHMB programme= **$48,795,801.73**
- Cost saving by local production of *A. kamali*= **$624,535.32**
- Total present value (net benefit)= $49,420,337.05
- Net present Value= *Net benefits – Cost of programme*

$49,420,337.05 – $568,627.94 = **$48,851,709.11**

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Benefit/Cost ratio

- Total present value/cost of the programme
  - $49,420,337.05 / *$568,627.94* = **86.9**
- For a project to be viable, it must have a benefit/cost ratio > 1
- Payback period
  - Zero discount rate
  - $17,000,000/12 mnts (assuming equal distribution of losses)= $1.42 million
  - Within one month, averted loses could pay for the project.

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Conclusion

- Demonstrating the benefits in a "dollar value" to policy makers makes investment in SPS related issues easier
- Present the problem in a way that politicians can understand
- Avoid short term benefits over long term gains
- Systematic surveillance allows for the timely detection of problems
- Have an emergency plan
- Dealing with exotic pests is never easy
- The public can be your best ally or worst nightmare. Keep them informed and updated!
- Maintain strong alliances with regional/international partners

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