Increasing Environmental Awareness in Indonesia

Canada supports the Integrated Pest Management program in Indonesia. The Economy and Environment Program for Southeast Asia (EEPSEA) has trained local farmers to use various pest control methods to reduce the use of pesticides. This has improved the health of residents and increased the gross domestic product (GDP) of the area. Through a study of a key research paper, students will examine several factors which have led to the success of this program. They will also learn the importance of proper pesticide use.

Grade Level
Grade 10

Time Required
120 minutes

Curriculum Connection
Northwest Territories – Social Studies 10-2: Living in a Globalizing World

Additional Resources, Materials and Equipment Required
- Student Handout: An In-depth Look at a Program of the EEPSEA (attached)
- Student Handout: Countries of Focus Map (attached)
  (from information on CIDA website and johomaps.com/world/worldblank_bw.html)
- Class set of atlases or use of online atlases on the internet
- Access to an overhead projector or data projector
- Access to computers and the internet

Websites
- CIDA Project Profile: Building Local Capacity in Environmental Economics acdi-cida.gc.ca/CIDAWEB/cpo.nsf/vWebCSAZEn/DA7B1901BAD8ADA285257261003CA077

Main Objective
The primary goal of this lesson is to introduce students to Canada’s work in international development in Indonesia by examining one specific project which involves training farmers on Integrated Pest Management.

Learning Outcomes
By the end of the lesson, students will be able to:
- identify and locate several countries of the world which are Countries of Focus for Canadian development assistance;
- identify some of the unique features of Indonesia;
- explore in detail the research into one of the projects which involves training local farmers to be environmentally aware and improving their health and standard of living through a reduction in pesticide use as well as integrating other practices into their farming techniques.
### Lesson

| **Introduction** | Distribute the *Countries of Focus Map* along with atlases and/or access to internet. (Note: the continents/regions are in bold lettering). Instruct students to locate, label and shade-in Countries of Focus.

Point out that Canada has changed its policy from spreading development money among many countries to focusing on the needs in only a few. Ask: “Why would Canada do this instead of trying to help most of the countries of the world?” |

| **Lesson Development** | Ask all of the students to locate Indonesia.

This lesson will focus on one project which is co-sponsored by Canada: Training Indonesian farmers to be less dependent on pesticides. Ask students to relate what they know about pesticide use (Why do farmers use pesticides? What are some problems which result when pesticides are not properly used?). Keep a record (on overhead/data projector) of students’ responses.

Distribute the *Student Handout: An In-depth Look at a Program of the EEPSEA*. Ask students to read the excerpts from the research paper and answer the questions (this can be done together as a class, by working in small groups or pairs, or individually). |

| **Conclusion** | Ask students to share their answers in small group settings (or in pairs). Students should refine their answers from the responses of others in their group. Next, ask each group/pair to share their completed answers with the rest of the class, working through one question at a time. |

### Lesson Extension
- Conduct a class debate about the use of pesticides in Canada.

### Assessment of Student Learning

Students will be assessed on their understanding of the concepts and their ability to extrapolate information from a research paper.
Further Reading

- Health Canada -- Background information on pesticide use
  

Link to Canadian National Standards for Geography

Essential Element #5: Environment and Society

- World patterns of resource distribution and utilization
- Use and sustainability of resources
- Environmental issues (e.g. global warming, loss of biodiversity, deforestation, ozone depletion, air pollution, water pollution, acid precipitation, disposal of solid waste)

Geographic Skill #2: Acquiring geographic information

- Systematically locate and gather geographic information from a variety of primary and secondary sources.
- Systematically assess the value and use of geographic information.
The following paragraphs are excerpts from a research paper examining the impact on local economies of educating Indonesian farmers to become less dependent on chemical pesticides by using an Integrated Pest Management (IPM) program. Canada is a sponsor of EEPSEA, which oversees this program, and is concerned about the way that pesticides are used and the resulting effects on both human health and the environment.

“The IMPACT OF THE INTEGRATED PEST MANAGEMENT PROGRAM ON THE INDONESIAN ECONOMY”

Budy P. Resosudarmo

October 2001

(Source: http://www.idrc.ca/eepsea/ev-27230-201-1-DO_TOPIC.html)

The chronic food shortage during the first two decades of Indonesian independence (1945-1965) prompted the Indonesian government to establish a comprehensive food intensification program as a national priority. Achieving and maintaining self-sufficiency in food, increasing farmers’ income, and providing strong support for the rapidly expanding industrial and service sectors were the main goals of this program. The food intensification program consisted of the widespread use of high-yielding modern seed varieties, the development of irrigation systems, the expansion of food crop producing areas, the increased use of chemical fertilizers and pesticides, the expansion of agricultural extension services, the establishment of farmer cooperatives and input subsidies, and the stabilization of national food crop prices… (p.6)

Despite the remarkable success of the food intensification program, the excessive use of pesticides caused serious environmental problems. These include acute and chronic human pesticide poisoning, animal poisoning, the contamination of agricultural products, the destruction of beneficial natural parasites and pest predators, and pesticide resistance in pests… (p.6)

To overcome these environmental problems caused by the overuse of pesticide, the Indonesian government adopted a strategy of integrated pest management (IPM) in the early 1990s. The government’s pest control policy changed from one which depended solely on pesticides to one which used a combination of control tactics, such as synchronized planting, crop rotation, the use of natural predators, and pesticides. It was reported that farmers who participated in the IPM program were able to reduce the use of pesticides by approximately 56% and increase yields by approximately 10%. The increasing yields are caused by the elimination of serious or large-scale pest outbreaks… (p.7)

It is in the interest of the Indonesian government to determine the overall effect of the IPM program on the national economy. If the program is proven to be significantly beneficial for the country’s national economic performance, it will be recognized as a national priority…(p.7)

Information on pesticide-related illnesses relies mostly on Achmadi’s work [a researcher from the Department of Public Health at the University of Indonesia], which provides the estimate for the number of acute and chronic pesticide poisoning cases.
Achmadi (1991) estimated that in 1988 approximately 3,000 cases of acute poisoning were associated with the use of pesticides in agricultural sectors. He also observed that approximately 20-50% of the farmers who used pesticides contracted chronic pesticide-related illnesses, including headaches, weakness, insomnia, and difficulty concentrating. Furthermore, Achmadi noticed that, on average, each time a farmer contracted acute pesticide poisoning, the farmer missed approximately five days of work; each time a farmer contracted chronic pesticide poisoning, the farmer, on average, missed approximately one day of work…(p.12)

The central aim of the national IPM program was to educate farmers in IPM using the “learning by doing” method. The Working Group first trained extension workers and field pest observers to teach farmers. By the end of 1991, 2,000 extension workers and 1,000 field pest observers were able to train approximately 100,000 farmers. Between 1991 and 1999, approximately 200,000 farmers—most of them rice farmers—were trained each year. Approximately 10% of these 200,000 farmers were chosen to receive further training so that they in turn could become trainers. These farmer trainers were required to teach in surrounding IPM training programs and were encouraged to train their neighbors on a one-on-one basis. The cost of all IPM training activities is approximately Rp11.25 billion (US$5.36 million) each year. From 1991 until 1992, most of the national costs of the IPM program were funded by a grant from the United States Agency for International Development (USAID). From 1993 until 1998, the main source of funding for the program was a loan from the World Bank (SEARCA, 1999)...(p.13)

Furthermore, the revenue from only a 5% increase in the tax on pesticides is enough to train more than 80% of rice farmers in the IPM technique over the next 20 years. The impact of more than 80% of rice farmers practicing the IPM technique over that time period are: (1) the avoidance of 23,000 and 79 million cases of acute and chronic pesticide poisoning, respectively, among rice farmers; (2) a total GDP gain equivalent to 22% of Indonesia’s GDP in 2000; (3) household income gains of 8-28%...(p.28)

Questions:

1. What organizations are involved in supporting the efforts of EEPSEA? Identify the countries where these organizations are based.
2. What is meant by “a comprehensive food intensification program”? Why did Indonesia implement such a program?
3. List the five environmental problems that resulted from the increased use of chemical pesticides. Indicate which one you believe might have had the greatest impact on the local communities. Explain why.
4. What were the factors which made the integrated Pest Management program successful? Why were pesticides not banned altogether?
5. Describe how farmers were trained for the IPM program. Do you think this was a good strategy? Why/why not?
6. With only a 5% tax on pesticides there will be enough funds to sponsor the IPM training for over 20 years. What are the proposed benefits of this?
Countries of Focus Map

Locate, label and shade-in Canada’s Countries of Focus (use an atlas or internet)

**Americas:** Bolivia - Caribbean Regional Program - Colombia - Haiti - Honduras - Peru

**Asia:** Afghanistan - Bangladesh - Indonesia - Pakistan - Vietnam

**Eastern Europe:** Ukraine

**North Africa and Middle East:** West Bank and Gaza

**Sub-Saharan Africa:** Ethiopia - Ghana - Mali - Mozambique - Senegal - Sudan - Tanzania