

## Procedures

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### 1. Explanation of the purpose of the lecture (5 minutes).

This lecture provides the participants with background information on how agricultural hazards can affect the reproductive health.

### 2. Discussion with the participants:

1. The participants will be asked to answer these questions at the beginning of the lecture to check their knowledge and after that their answers will be discussed.

- What are the underlying causes of agricultural pollution?
- What effect is agricultural pollution having upon the environment?
- What actions are being taken in response to agricultural pollution?

### 3. Presentation of the lecture by PowerPoint slides:



Framing in the rich Nile Delta, between Cairo and Alexandria.

[http://onlinejournal.com/artman/publish/printer\\_2043.shtml](http://onlinejournal.com/artman/publish/printer_2043.shtml)

Agriculture is one of the most fundamental sectors of any national economy and the lifeblood of rural communities throughout the world. It occupies 35% of the world's total land surface (with 11% under cultivation and 24% under permanent pasture) and engages almost 50% of the working population. Agriculture is also one of the oldest examples of an activity whereby human beings have sought to control and manipulate the environment for their own benefit. The farming methods employed to achieve this vary greatly from utilizing the

most recent advances in science and technology, such as the application of biochemistry, genetic engineering and computer technology, to traditional techniques using the simplest of tools.

#### • **Understanding pollution caused by agriculture**

For most of its history, agriculture has been relatively benign as a source of environmental pollution. Even during the eighteenth and nineteenth centuries when new industrial technologies were revolutionizing other areas of human

activity, farmers continued to rely largely upon natural processes in their pursuit of crop and livestock production. Consequently the traditional mixed farm was a fairly closed system with minimal reliance upon external inputs and minimal negative impact upon the natural environment. Yet while farmers clearly have a long-term interest in conserving the productive capacity of the environmental systems within which they operate, their special sense of 'stewardship' has been insufficient to prevent the rapid changes in agricultural production over the past 50 years causing significant environmental disruption. A full understanding of the pollution problems caused by agriculture clearly involves some basic scientific knowledge about the nature of different pollutants and the way in which they behave in the environment. It also involves addressing three broader questions:

- What are the underlying causes of agricultural pollution?
- What effect is agricultural pollution having upon the environment?
- What actions are being taken in response to agricultural pollution?

These basic questions are derived from what is sometimes referred to as the Pressure-State-Response (PSR) framework. The framework acknowledges that the relationship between contemporary economic

activity and the environment functions as a simple 'loop' within which:

- PRESSURE on the environment from human and economic activities leads to changes in the:
- STATE or condition of prevailing environmental resources which provoke:

- RESPONSES by society to change the pressures on, and state of, the environment (Fig 1).

The PSR framework is very flexible with numerous variants for specific economic sectors. It is well suited to the investigation of agriculture and pollution since it offers the basis for an integrated analysis within which scientific understanding of the causes, effects and control of agricultural pollution is seen to be inextricably interwoven with the broader economic, social and political context in which agriculture operates. In particular, the PSR framework implies the fundamental importance of understanding the linkages between the three 'P's of agricultural Policy, agricultural Production and agricultural Pollution. For example, it is widely acknowledged in the European Union that agricultural policy in the 1970s and 1980s significantly changed the nature of agricultural production and that this had a number of negative environmental effects, including an increase in the incidence of agricultural pollution. In order to address these environmental effects, agricultural policy is now being modified to encourage less environmentally damaging forms of agriculture - thereby completing a simple 'PSR-loop'.

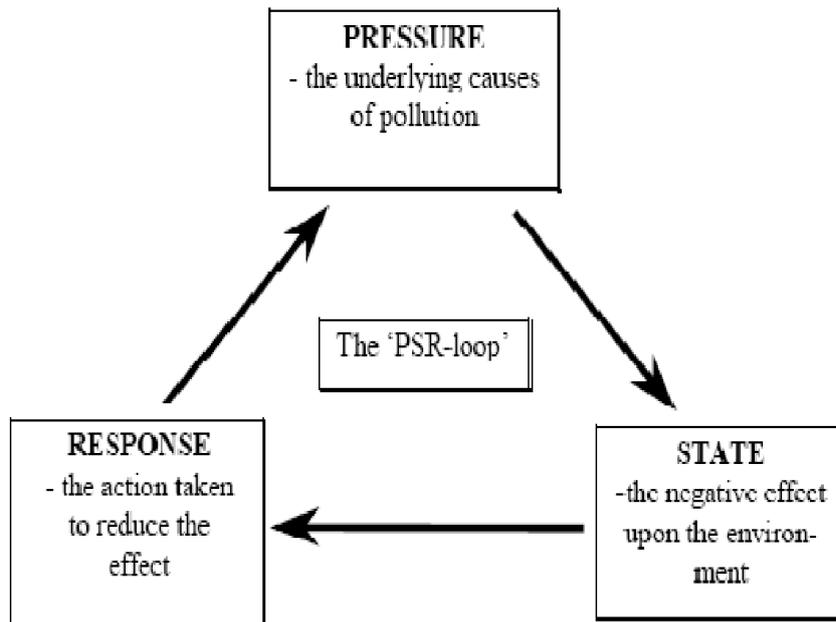


Fig 1. Pressure-State-Response (PSR) model

- **The underlying causes of pollution from agriculture**



Threshing wheat on a Nile Delta farm between Cairo and Alexandria.

[http://onlinejournal.com/artman/publish/printer\\_2043.shtml](http://onlinejournal.com/artman/publish/printer_2043.shtml)

Pollution problems occur when the rate of pollutant emissions exceeds the capacity of the environment to absorb them. There are a number of reasons for this situation having arisen in agriculture involving various interactions between:

- **Prevailing environmental factors, such as meteorological conditions, local topography and soil conditions**

For example, streams are very susceptible to local agricultural practice particularly if heavy rain follows the application of fertilizer or organic manure. This susceptibility to pollution can be accentuated by local topography and soil type leading to rapid down slope runoff or leaching losses.

- **Changes in technical inputs and management practices at the farm level**

For example, the transition of agricultural practice from balanced rotational cropping to continuous arable cropping has been a major contributor to the increase in nitrate leaching observed in many parts of the