

The power of policy

by **Nelissa Jamora and Debbie Templeton**

Safer and more effective pesticide use by Philippine farmers provides a striking example of the impact of good policy, but good research must be a starting point

In the late 1960s, newly developed, high-yielding rice varieties launched the Asian Green Revolution, which rapidly pushed up yields and allowed rice production to keep pace with population growth.

In the Philippines, as in many other countries, widespread use of pesticides expanded in step with the new varieties. This was largely due to concerns that crop losses from pest infestation would negate the benefits of planting modern rice varieties. Even the release of pest-resistant varieties did little to curb the growing use of pesticide during the 1970s and into the 1980s. Indeed, the Philippine government at the time promoted the wide and intensive use of agro-chemicals among small farmers from 1973 to 1986 under the *Masagana 99* scheme.

By the 1980s, it was clear that indiscriminate use of pesticides could exacerbate, rather than alleviate, pest problems. In addition, there was growing evidence of the ill effects of the injudicious use of toxic pesticides on both the environment and human health. Moreover, research undertaken by the International Rice Research Institute (IRRI) showed that farmers' private health costs were greater than any economic benefits gained from using pesticides without appropriate health, safety, and environmental knowledge and the attendant precautions.

In response, and in keeping with international protocols, the government under President Fidel Ramos (1992-98), through the Fertilizer and Pesticide Authority (FPA), instigated a new suite of pesticide regulatory policies and implementing guidelines. These aimed to ban or restrict the use of commonly used but highly toxic pesticides in rice

production, and encourage safer pesticide management practices (these initiatives are collectively referred to here as the 1992-96 pesticide policy package, or PPP).

However, even with the best political will, getting millions of farmers in a developing country to adopt new regulations is difficult. To determine whether or not the regulatory policy changes made a real difference on farms, IRRI conducted a survey of rice farmers in 2007 in Quezon, Nueva Ecija, and Laguna provinces. The survey results were compared with corresponding data collected in 1989-91 surveys undertaken before the policy changes as part of IRRI-led research on types and quantities of pesticide used, pesticide application and storage practices, incidence of farmer poisonings, and the overall effects of pesticide use on the health of Philippine rice farmers.

The primary policy advice arising from this research was to restrict the use of hazardous pesticides by imposing and implementing bans on those pesticides that pose acute or chronic health effects or adversely affect the environment—a recommendation that was reflected in the PPP.

Changes in types of pesticide used

Prior to the PPP, Philippine rice farmers commonly used pesticide classified as World Health Organization (WHO) Hazard Class I (highly or extremely hazardous) and II (moderately hazardous).

On 1 June 1994, the FPA banned or restricted the use of all Class I and some Class II pesticides. Despite this, importation and use of banned or restricted pesticides continued for a number of years. In response, an task force was formed to minimize

pesticide smuggling. In addition, the FPA allowed the use of legal generic-brand pesticides, resulting in lower costs that reduced the attraction of cheap, but illegal, pesticides.

In the 2007 survey, 93% of the farmers said they could no longer find the banned chemicals in the marketplace, and 90% said they no longer use the banned pesticides. Further, more than 99% of the chemicals being used by the respondents were registered for use in rice production in the Philippines, even though 29% of the respondents said that they would still use the banned pesticides if they were available despite recognizing the health and safety issues.

In sum, the survey results indicated that the FPA has largely been successful in promoting the use of less toxic pesticides. Of the registered alternatives now available, 61% are classified as Category II (moderately hazardous), 28% as

Table 1. Pesticide management and safety practices (% of farmers), Nueva Ecija, 1991 and 2006.

Preventive/safety measures	Nueva Ecija (% of farmers reporting)	
	1991	2006
Avoid smoking while spraying	61	92
Avoid spraying into the wind	63	94
Avoid spraying when very hot (before 8:30 a.m.)	72	92
Eat or drink before spraying	9	78
Wash immediately after spraying	6	86
Wash sprayer after use	83	84
Wash-water not thrown in irrigation canal	17	64
Recap bottle after use	83	86
Do not recycle empty bottles	17	34

Table 2. Deaths due to pesticide poisoning.

1982-85		1991-95		2000-01	
Cases	Deaths	Cases	Deaths	Cases	Deaths
1,704	332	336	63	327	18

Category III (slightly hazardous), and 11% as Category IV (unlikely to present a hazard in normal use).

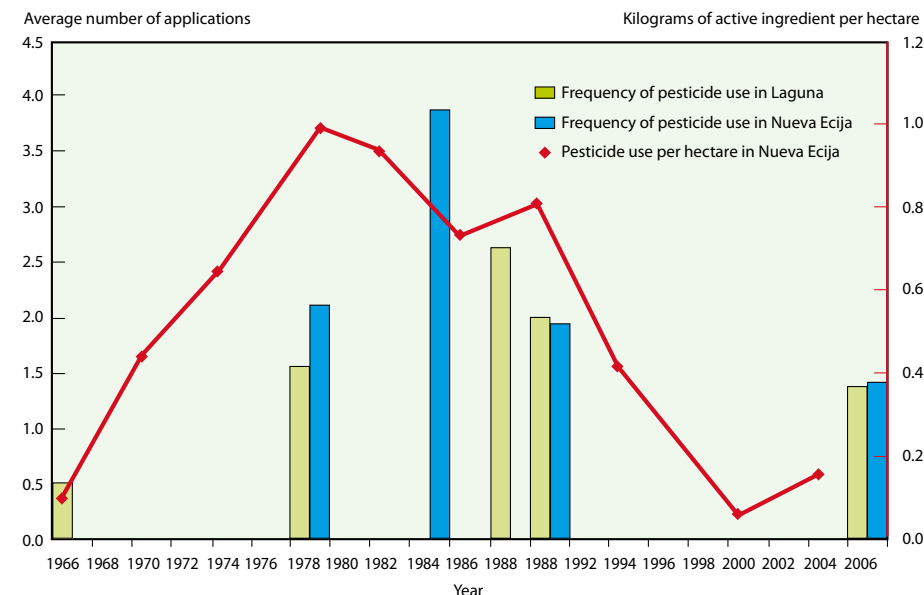
Unsafe pesticide practices in the Philippines have been documented in several studies. The 1989-91 IRRI studies found that, even if farmers were aware that pesticides were hazardous, they often lacked knowledge of proper pesticide management. As part of the PPP, the FPA thus encouraged pesticide companies to improve their safety information and implemented a hazard awareness campaign aimed at teaching rural health officers to recognize and treat pesticide poisoning cases. Dealers, farmers, and Department of Agriculture field personnel were trained in the safe handling of pesticides, and their judicious use was promoted through a mass media campaign and integrated pest management workshops.

Data collected before and after the PPP show significant increases in the number of farmers following recommended pesticide safety measures (Table 1). For example, in 1988-89, only 2% of the farmers in Laguna and Nueva Ecija wore both long sleeves and long pants when spraying, compared with 85% in 2006. In 1988-89, 61% of the farmers avoided smoking while spraying and 63% avoided spraying into the wind; by 2007, more than 90% of the farmers had adopted these safety practices. The number of farmers who wash immediately after using pesticides rose from 6% at the end of the 1980s to 86% in 2006.

Pesticide poisoning

Unsafe pesticide application, storage, and disposal practices all contribute to pesticide poisoning. Sadly, however, the majority of recorded cases are intentional. Of the 4,031 acute pesticide poisonings reported by government hospitals from 1980 to 1987, 603 cases resulted in deaths, and almost two-thirds of these were suicides.

A series of three studies led by the Philippine Department of Health (DOH) showed a clear drop in both the number of cases of, and deaths



Trends in pesticide use and frequency of application, Central Luzon (1966-2000), Laguna (1966-2000), and Nueva Ecija (1979-2006).

due to, pesticide poisoning before and after the introduction of the PPP (Table 2). These data are not directly comparable because the number of regions covered in each study varies; however, the incidence rates (the number of poisonings per 100,000 people) fell from 3.27 in 1982-85 to 1.08 for the 5-year period 1991-95. Further, from the late 1980s to 2007, the percentage of farmers reporting pesticide illness fell by almost half.

Although the aim of the 1992-96 PPP was to bring about a change in the type of pesticide used (from more hazardous to less hazardous) and pesticide management (toward safer application and storage methods) rather than the quantity used, the changes in quantity and number of applications are of interest for two reasons.

First, they provide a measure of changes in pesticide exposure not necessarily due to the policy change. As can be seen from figure above, the amount of pesticide used began to drop before the PPP was introduced. This drop may have continued, albeit at a slower rate, even if the PPP had not been implemented.

Second, because the more hazardous pesticides are cheaper than their less hazardous counterparts, the PPP bans indirectly raised the cost of chemical pest control.

Therefore, some of the fall in quantity of pesticides used and number of applications can be attributed to the PPP-induced price increase. The 2007 IRRI surveys showed that, on average, farmers in 2004 used one-fifth the amount of pesticide they used in 1991. Over the same period, frequency of sprays fell from around two applications per season to 1.4.

The success of the PPP offers a good example of the value of high-quality, independent agricultural research. By contributing to the body of research on the health effects of pesticide use, IRRI played a role in bringing about policy changes that drove a reduction in the use of hazardous pesticides, improved awareness of and adherence to their safe use, and reduced the incidence of pesticide poisoning. The PPP also had an indirect role in reducing the overall amount and frequency of pesticide use. Thus, the PPP contributed substantially to an improvement in Filipino farmers' health and well-being, and produced very large benefits in terms of private health costs avoided. 🍌

Nelissa Jamora is an agricultural economist in IRRI's Social Sciences Division (SSD). Debbie Templeton worked as an Impact Assessment Specialist in SSD from 2005 to 2008.