

# Gender Analysis of Women in the Philippine Agriculture and Their Occupational Issues

By Jinky Leilanie Lu<sup>1</sup>

## Abstract

Feminist research shows how gender, in interaction with other socioeconomic differentiation theories on class and ethnicity, influences agrarian transition, health patterns, and economic development. In the highland community where this study was conducted, women play a very important role in the production of vegetables and crops. At the same time, there are hazards facing these women predisposing them to certain occupational health issues. As such, this research study aimed to look into occupational issues of women, as well as certain cultural, political, socio-economic perceptions and attributes that affect women's occupational issues. 251 women farmers from identified communities using cluster sampling were included in this study for the survey questionnaire.. The data collection tools were structured personal interview, key informant interview, and secondary data gathering. 59% of the women said that farming was family-based. 28.3% had children under 18 years old involved in farming. The most commonly used pesticide was manzeb, a carbamate, for a duration of 20 years. 59.4% reported that sickness was perceived to be due to occupational exposure to pesticides during application in the field. In the FGDs cultural, political, and socio-economic factors that affect their occupational and health issues were looked into. This study aimed to target women in agriculture and their occupational issues to influence local and national policies concerning them.

*Keywords:* gender analysis in agriculture, women farmers, feminization of agriculture, pesticide exposure, socio-political factors in gender differentiation, Philippino women

## Introduction

The study was conducted in Benguet which is located in northern Philippines, and has the highest altitude for a landbased population. The area is considered as the “salad bowl of the Philippines” because of its high commercial production of vegetables. Farming in Benguet is family-based, and many women are engaged in farming (FPA, 2001). This study dealt with women farmers who have grown up in the area, and whose farms were previously owned by their parents or grandparents.

Aside from socioeconomic and cultural factors in the agricultural sector that disadvantage women compared to men, there are also physical factors that predispose the former to greater health and safety risks. The reproductive function of women is affected by farming activities and by chemicals used. Differences in size and stature, as well as relative low oxygen uptake may also predispose women to certain injuries and illnesses (McCoy, et.al., 2002).

---

<sup>1</sup> Research Professor 1, National Institutes of Health, University of the Philippines Manila Manila, Philippines, jinky\_lu@yahoo.com

### **Context of the study**

This study was conducted in the context of having much gender bias in occupational epidemiology in agriculture. Very few researches focus on women farmers in the Philippines. Besides, even in terms of occupational and environmental health exposures, the chronic disabling effects of agricultural work and pesticide exposure have been given less attention compared to acute immediate effects. Thus, leaving women's occupational and environmental issues left unaddressed. If occupational and environmental epidemiology is to have a meaningful impact on health of women farmers in developing countries, it must be gender sensitive. In the area of investigation, women actively participate in farming and agricultural work. In a study by Lu in 2007, women were equally involved in agriculture as their male counterparts.

It is not only in Benguet, Philippines that we see the pattern of women's involvement in agriculture. In a study in Kampal City, Africa, women were reported to more likely grow food crops on contaminated land, which makes them more vulnerable to health risks associated with improper management of agriculture. In another study, women take on more work during the entire agricultural work compared to the men farmers (Nabulo, et.al., 2005).

### **The feminization of agriculture**

Feminist research influences agrarian transition, health patterns, and economic development (Preibisch, 2002). Farming is family-based which involves many members of the household including women and children. The role of women in agriculture in this study area was not merely complementary to that of men, or a provision of support system. The work of women farmers are the same as their male counterpart ranging from pesticide application, clearing the land, fertilizer application, to harvesting and trading. Similarly, in the study of Ilcan in 1994, women in Turkey perform labor-intensive operations of ploughing, hoeing, planting, weeding, and caring for and feeding animals as well as harvesting of wheat and corn.

The significant contribution of women to farming has also been noted in the study of McCoy, et.al. in 2002, wherein women do not only participate in the traditional roles, they also work with their husbands in farming. In fact, they observed that more daughters are entering the farming business as partners with other family members or as independent operators. In the United States, statistics show the percentage of women engaged in agriculture has increased, and women's participation in agriculture is increasing faster than in other business segments. These farm operations predispose women to health hazards that result in illness, injury or even death (Meeker, et.al., 2002).

### **Women are at risk**

Health problems due to pesticide exposure specifically in women is one of today's main inquiry in the agricultural sector. Women generally are more predisposed to accumulating endocrine-disrupting chemicals and/or facing greater exposures related to changes in body-fat levels and increased levels of hormonally sensitive tissues (Ribas-Fito, 2006). Based on the study done by Rao, et.al. in 2007, pesticide exposure has been linked with a wide range of chronic health effects, immediate and delayed. Pesticides directly or indirectly affect the reproductive system of women manifesting in

abnormalities in fertility (ability to produce offspring) , pregnancy outcome (abortion or arrested childbirth), reproductive cycle normality (menstrual cycles) and hormone production (Arbuckle, et.al., 1998).

Several studies have been documented on adverse effects of pesticides on women. In a study, 28% of those who were highly exposed to pesticides had pregnancies preceded by medical consultations because of fertility problems compared with only 8% in individuals with low exposure (de Cock, et.al., 1995). Pesticide exposure, particularly to DDT was associated with breast cancer (Woolf, et. al., 1993). There is also increased risk in abortion as shown in the local study of Crisostomo in 2000. The latter study showed that there was 4.06% spontaneous abortions among households engaged in continuous pesticide application compared to 0.6% among integrated pest management (IPM)users, and that birth defects was higher by 3.5% among pesticide users compared to 0.91% among IPM users.

This research study aimed at determining the health issues of women in farming as well as risks related to pesticide exposure. The result of this investigation can be used as an essential tool for the formulation of an integrated program on safety and health of women farmers in the agricultural sector. This investigation can also serve to increase the awareness of women farmers on pesticide exposure throughout the country.

## Methods

The study focused in Benguet, Philippines which is the largest vegetable growing area for certain vegetables in the Philippines. More than 75% of the community are engaged in commercial agriculture. This is why the area was chosen.

251 women farmers from the identified communities in Benguet were the sample population for the survey questionnaire. They were selected using cluster sampling. The clustering was based on the top four producers of vegetables in the province of Benguet. Three focus group discussions were conducted consisting of 6-7 women farmers each.

The data collection tools included structured personal interview survey questionnaire, and secondary data gathering. The questionnaire contained information on demographics, pesticide practices and occupational risk factors. The FGDs looked into cultural, political and socio-economic factors that affect women's occupational and environmental health issues.

This manuscript arises from an overall project that was given ethical clearance by the National Institutes of Health, Univeristy of the Philippines Manila.

## Results and Discussion

### *Survey Questionnaire*

There was a total of 251 women farmers in this study. The farmers interviewed were 15-78 years old, majority belonged to the 36-50 age group (49.4%). See Table 1. 76.3% of the respondents were married followed by widowed and single individuals at 16.3% and 4% respectively. Very few were separated or divorced.

**Table 1. Distribution of age groups of women farmers**

Age range	Frequency	Percentage
< 18	3	1.2
20-35	26	10.4

36-50	124	49.4
51-65	71	28.3
>66	22	8.8

Married farmers being the bulk of this population may predispose their families to pesticide exposure through take-home exposures such as toxins from the clothes and shoes worn during pesticide activities or exhalation from the parent's lungs (Cantor and Young- Holt, 2002).

A majority of the farmers were able to finish or at least reach high school level (31.9%); about 34.3% reached grade school, 22.3% reached the collegiate level, 4.4% underwent vocational studies while about 1.6% reached post graduate education. See Table 2.

**Table 2. Distribution of women farmers according to educational attainment**

	Frequency	Percentage
Grade School	86	34.3
High School	80	31.9
College	56	22.3
Vocational	11	4.4
Post-graduate	4	1.6
Did not attend school	3	1.2

When asked about the members of the household working with pesticides and assisting in the farm, 59% said that other family members were involved. The mode of adults working with pesticides was 3 (41.8%). 71, or 28.3% said that children under 18 years old were involved in pesticide and farming. This can pose as a significant problem in regard to health of the household. McCauley et al. (2003) found significant association between pesticide residues and the number of family members working with high exposure pesticide activities.

Only 187 respondents chose to disclose their sexual activity and about 60.43% had been sexually active for the past five years. 0.5% of the women had their menarche before the age of ten. The mean age of first menstruation was 13 years old ( $\pm 1.955$ ). 19.3% had theirs at the age of 11-13 years old, 19% at the age of 14 to 16 years old and 3.5% experienced it at a latter age (more than 16 years old). 15.8% had normal duration of menses while 2.3 % had prolonged duration of menses. One hundred and twenty six women or 31.5% had regular menstruation with majority having 28 day menstrual cycle (16.5%). 21% of the women said they had increased menstrual flow while seventy five (18.8%) reported having dysmenorrheal or menstrual pains.

Data showed that 11.2 % of the mothers had aborted pregnancies. This may be linked to pesticide exposure. A study has shown the positive correlation of heavy or chronic pesticide exposure with spontaneous abortion (Bretveld, et.al., 2008).

The most commonly used pesticides in terms of duration in years was manzeb, a carbamate, for a duration of 20 years. This was followed by chix, a pyrethroid, for 19 years, and then by tamaron, an organophosphate, for a duration of 18 years. Organophosphorus terminates the action of acetylcholine neurotransmitter that leads to delayed and irreversible neuromuscular effects usually seen in extremities (Vermeire, 2003; Keifer et. al., 2007). In the common parlance, this can lead to paralysis.

In terms of amount used, chix topped the list at 11 liters per application, followed by maznzate, a carbamate, at 10 Liters. The rest of the information is shown in Table 3.

**Table 3. Distribution of Type of pesticide by brand name used among women farmers in Benguet (N=251)**

Brand name	Active ingredient	Chemical grouping	Duration		Amount used	
			Mean	Standard deviation	Mean	Standard deviation
Sumicidine	Fenvalerate	Pyrethroid	15.5	11.6	7.5	7.0
Sabedong	Cypermethrin	Pyrethroid	13.6	12.8	8.3	7.2
Magnum	Cypermethrin	Pyrethroid	13.2	12.5	5.9	7.1
Flash	Cypermethrin	Pyrethroid	10.1	7.7	5.7	6.5
Karate	Lambdacyhalothrin	Pyrethroid	16.0	12.5	7.5	14.1
Bida	Lambdacyhalothrin	Pyrethroid	11.8	9.2	4.8	5.9
Chix	Betacypermethrin	Pyrethroid	19.0	14.9	11.0	8.7
Tamaron	Methamidophos	Organophosphate	18.0	11.3	3.9	7.0
Selecron	Profenofos	Organophosphate	13.1	10.4	5.4	6.2
Siga	Chlorpyrifos	Organophosphate	11.1	9.0	8.1	7.1
Round up	Chlorpyrifos	Organophosphate	7.8	7.9	7.6	7.1
Manzate	Mancozeb	Carbamate	12.1	9.7	10.2	15.8
Manzeb	Mancozeb	Carbamate	20.0	10.0	1.0	.01
Cartap	Cartap	Carbamate	11.4	10.0	7.0	7.2
Dithane	Mancozeb	Carbamate	17.3	11.3	6.0	11.6
Lannate	Methomyl	Carbamate	15.1	11.5	7.3	17.7
Padan	Cartap HCl	Carbamate	9.3	8.9	3.5	5.1

18.7% of the women farmers said that they received instructions from government and business establishments on safety precautions in agriculture and pesticide application. However, 81.3% still did not receive safety instructions.

In terms of use of personal protective equipments, majority said that they wore them (71%). However, when itemized, 63.3% did not wear coveralls, 68.5% did not wear gas masks, but majority wore cloth wrapped around their face as protection from inhalation of pesticide vapours. 70.5% did not use eye goggles, while only 5% did not wear boots. The most frequently used personal protective equipment consisted of boots and gloves. This is consistent with a study where gloves were the most commonly used personal protective equipment because the hands were the most exposed areas (Hines et al., 2007).

### **Occupational Health Issues of the Women Farmers**

Most of the women farmers reported getting sick once (47.4%), or twice (41.4%) during the past year due to work. Only 21% of them received medical attention. 59.4% reported that sickness was due to occupational exposure to pesticides during application in the field.

170 respondents or 67.7 % experienced muscle pain after pesticide exposure, while 59.8 % and 58.2% complained of weakness and easy fatigability, respectively.

38.6% reported having fever, and 28.7% experienced loss of appetite. Adverse health symptoms associated with risk factors in this study were also confirmed in other studies manifesting in fever and muscle pain (Meggs, 2004), weakness and easy fatigability, and loss of appetite (Boiko, et.al., 2005).

Complaints of blurring of vision (43.8%) eye pain (42.3%), tearing of the eyes (40%), eye itchiness (39%) and eye redness (36%) were the most commonly reported symptoms of the eye. As for respiratory symptoms, the women farmers often complained of coughing (55%), difficulty of breathing (20%), breathlessness (23.3%) and having pulmonary secretions (18.5%). In an experimental study done to guinea pigs, chlorpyrifos, an organophosphate, was found to cause airway hyperreactivity due to inhibition of acetylcholinesterase (Allison, et.al., 2004). In another study, farm workers with pesticide exposure usually complained of wheezing and breathlessness that could be indicative of chronic pulmonary diseases (Yelemtsehay and Tadesse, 2002).

The use of pesticides in the agricultural sector is widespread. Pesticide exposure, most of which are unintentional, unknowing, and unwilling is widely recognized in rural areas because of difficulty of tracking migrant, temporal, and poor farm work populations, and in developing countries due to excessive and inappropriate applications, and inadequate conditions such as lack of protective equipment (Ribas-Fito, 2006). Although pesticide exposure can occur anywhere, farm workers in medically underserved communities are at risk, and women farmers are at greater risk due to their lack of access to health resources (Quackenbush, et.al., 2006).

#### **Results of FGD with Women Farmers**

The table below shows the result of the FGD. It reveals certain cultural, political, and socio- economic perceptions and attributes that affect women’s occupational health issues.

**Table 4. Cultural, political, social and economic perceptions and attributes that affect women’s occupational issues**

Factors	Specific responses of Women Farmers
Cultural factors	Women farmers in particular, and farmers in general are not susceptible to illness. They believe that they are resistant to illnesses.
	The women believed that pesticides are not really toxic. Farmers are not aware that no matter how much more pesticide is used, it does not make it more potent. A threshold level is attained with a particular dosage.
	The women farmers are not aware that chronic illnesses can develop over a long period of time, and may not be detectable immediately after exposure to a hazard, and may also not be attributable to work exposures because of its long standing effect.
	The women farmers believe that occupational injuries and illnesses occur because of fate, not because of the presence of unsafe conditions and unsafe practices.
	The women farmers believe that makeshift personal protective equipment (PPE) are as good as the required standard PPEs. The

	<p>makeshift PPEs of the farmers included handkerchiefs, t-shirts wrapped around their faces, and bonnets.</p> <p>The women farmers do not see the importance of wearing personal protective equipment. Besides, PPEs are reported to be costly.</p> <p>The women farmers said that there is lack of recognition by the formal health care system of traditional and indigenous health knowledge and practices.</p>
Political factors	<p>Absence of surveillance of health and injuries among women farmers.</p> <p>Absence of occupational epidemiology among women.</p> <p>Absence of programs specifically aimed at women farmers' health.</p> <p>Farmers organization are dominated by men, and that most women remain at home or in the farm.</p> <p>Women have limited access to health insurance.</p> <p>Insufficient appreciation by political actors of factors that affect women's decision to access health care such as timing of services, lack of time, lack of transportation fees, and unavailability of women due to their household chores.</p>
Socio-Economic factors	<p>Health is a cost.</p> <p>Health is secondary to commercial farming.</p> <p>Health of vegetable crops given more importance than women's health.</p> <p>Women reported of difficult access to hospitals and clinics because of work, distance from place of work, and economic cost of leaving the farm.</p> <p>Impact of globalization on prices of fertilizers, pesticides, and competition is affecting the women farmers. As such, there is no extra resource allocated for health expenditures.</p> <p>Women farmers wait longer to seek medical care.</p>

There seems to be a lack of knowledge among women farmers on the adverse effects of pesticide exposures and the need for personal protective equipments. But where personal failures set in due to lack of resources, then political actors should intervene in the provision of a responsible and accessible health care. The women reported that their access to health insurance is limited, and that there is insufficient appreciation by political actors of factors that affect their decision to access health care such as timing of services, lack of time, lack of transportation fees, and unavailability of women due to their household chores..

The women framers also said that political actors and technical personnel engaged in agricultural programs are not cognizant of their cultural mileu and practices of managing their health. The women said that they are the last to seek medical care because of their home and farmwork. They seek self health remedies and use of herbs when they

fall ill. The women farmers also stressed economic profit taking precedence over health issues.

The liberalization of the agricultural market in the Philippines was perceived by the women farmers in this study to have a negative impact on their productivity and profit. They said that they could not compete with the influx of cheap agricultural crops from China with the rising cost of agricultural inputs such as pesticides and fertilizers. This is a concern that the local and national governments should look into.

## **Discussion**

### *Gender analysis and balanced development*

Agricultural health is often understood as men's issues since agricultural work is regarded as masculine. In developing countries, however, such as in the Philippines, women are equally and actively engaged in agriculture. There are even studies that show women's engagement in agricultural work as more intense than that of the male. UNICEF identified that women make up the majority of the population working in agriculture in most developing countries, but they are marginalized with respect to economic and social empowerment (2009). Based on the 2000 UN report, women are twice as likely as men to be involved in agriculture-related activity. Labor participation of women workers in the agricultural labor force vary, but globally, women have a principal role in agribusiness, food processing, and consumer-related activity, marketing and value added food processing. Despite this vital role of women in agriculture, their occupational health issues are rarely discussed and covered by researchers and policy makers.

Espousing women's agricultural and occupational issues enables us to understand that women are also exposed to hazards in agriculture, not only men farmers. By having this gender analysis of women's agricultural and occupational issues, we can have hard data and real statistics on women's health issues in the agricultural sector. Analysis of the situations of women can also provide an understanding of their dilemma, and thus provide basis for change in legislation, cultural practices, policies, and programs that will benefit them.

### **Pesticides and Women Farmers**

Due to the need for enhance crop protection and productivity, many women farmers utilize fertilizers and pesticides. Due to their intrinsic toxicity, in most countries a specific and complex legislation prescribes a thorough risk assessment process for pesticides prior to their entrance to the market. This is often referred to as pre-risk assessment. Then there is also the post risk assessment to assess the risk of pesticides to exposed populations. Women in the study community are at risk since majority of them are farmers, and their homes are also interspersed within farming communities. Gender analysis in agriculture calls for a sustainable development model that also takes into consideration the occupational risks in agriculture. Maroni, et.al., in 2006 said that the experience of many countries has shown that prevention of health risk caused by pesticides is technically feasible and economically rewarding for framers and the whole community due to the reduction of health cost.

Gender differences and inequalities lead to inequity in the health care system since women and men have different occupational roles. Even in agricultural activities, women take much of the burden for agricultural productivity. As a result of the unique

role and work that women do in agriculture, there are specific occupational injuries and illnesses that they are confronted with. Coupled with lesser access to health resources and their propensity to wait longer to seek medical care make them vulnerable to health problems.

### **Conclusion**

This manuscript has investigated certain factors affecting the occupational issues of women farmers in Benguet. Current knowledge on the adverse effects of pesticides especially on the health of women is largely insufficient.

It is important that pesticide regulatory agencies restrict the use of toxic pesticides, and curb overuse of these chemicals. Women and agriculture are a good match, but women and pesticides do not go together perfectly.

Gender analysis is seen as essential for solving agricultural and environmental problems. The role of women in agriculture needs to be recognized, and institutional support must be given including health and health care reforms for women farmers. This study conducted in the Philippines shows the inherent work issues of women due to their major role in farming and pesticide application. .

Gender analysis in agriculture and its many aspects is essential for policy formulation and programme planning to ensure efforts are taken into consideration for women farmers as well as for equity in resource allocation and a balanced development that benefits not only men but also women farmers.

### **References**

1. Allison D Fryer, Pamela J Lein, Angela S Howard, Bethany L (2004) Mechanisms of organophosphate insecticide-induced airway hyperreactivity *American Journal of Physiology : Lung cellular and molecular physiology*. Bethesda 30(5):5.
2. Arbuckle T, Sever L. (1998) Pesticide Exposures and Fetal Death: A Review of the Epidemiologic Literature. *Critical Reviews in Toxicology* 28(3), 229-70.
3. Boiko P, Keifer M, Furman J, Weyrauch K, Hanks C. (2005) Cholinesterase Monitoring for Agricultural Pesticide Handlers: Guidelines for Health Care Providers in Washington State.
4. Bretveld R, Hooiveld M, Zielhuis G, Pellegrino A, van Rooij I, Roeleveld N. (2008) Reproductive disorders among male and female greenhouse workers. *Reproductive Toxicology* 25:107-114.
5. Cantor A, Young-Holt B. (2002) Pregnancy related symptoms among farm workers in rural Honduras. *International Journal of Occupational and Environment Health*. 1:41-46.
6. Crisostomo L, Molina V. (2002) Pregnancy outcomes among farming households of Nueva Ecija with conventional pesticide use versus integrated pest management. *International Journal of Occupational and Environmental Health*. 8:232-242.
7. de Cock J, Westveer K, Heederik D, te Velde E, van Kooij R. (1995) Time to Pregnancy and Occupational Exposure to Pesticides in Fruit Growers in The Netherlands. *Occupational and Environmental Medicine* 52(6), 693-699.
8. Fertilizer and Pesticide Authority List of Pesticides, 2001

9. Handal AJ, Lozoff B, Breilh J, Harlow SD. (2007) Neurobehavioral development in children with potential exposure to pesticides. *Epidemiology*.18(3):312-320.
10. Ilcan SM. (2002) Peasant struggles and social change: Migration, households and gender in a rural Turkish society. Health hazards and preventive measures of farm women. *Emerging issues*. pubmed.com
11. Keifer MC, Firestone J. (2007) Neurotoxicity of pesticides. *J Agromedicine*. 12(1):17-25.
12. Lu, JD. (2007) Gender Differentiation among farmers in the Agricultural Sector in Benguet, Philippines. *Journal of International women Studies*. 9(1): 176-199.
13. Maroni M, Fanetti AC, Metruccio F (2006). Risk assessment and management of occupational exposure to pesticides in agriculture. *La Medicina del lavoro*. 97(2):430-437.
14. McCauley LA, Michaels S, Rothlein J, Muniz J, Lasarev M, Ebbert C. (2003) Pesticide exposure and self reported home hygiene: practices in agricultural families. *American Association of Occupational Health Nurses Journal* 51:113-119.
15. McCoy CA, Carruth AK, Reed DB. (2002) Women in agriculture: risks for occupational injury within the context of gendered role. *J Agric Saf Health*. 2002(1):37-50.
16. Meeker BJ, Carruth A, Holland CB. (2002) Health hazards and preventive measures of farm women. *Emerging issues*. *AAOHN J*. 50(7):307-14.
17. Meggs WJ. Permanent paralysis at sites of dermal exposure to chlorpyrifos. *J Toxicol Clin Toxicol*: 2004;42 (7): 991-992.
18. Nabulo G, Nasinyama G, Smith D, Cole D (2005). Gender Analysis of Urban Agriculture in Kampala, Uganda In: *UA Magazine No. 12 - Gender and Urban Agriculture*
19. Preibisch KL (1994) Defending food security in a free-market economy: The gendered dimensions of restructuring in rural Mexico. 34 pubmed.com
20. Quackenbush R, Hackley B, Dixon J. (2006) Screening for pesticide exposure: a case study. *Journal of Midwifery & Women's Health* 51(1): 3-11.
21. Ribas-Fito N. (2006) Silent Invaders: Pesticides, Livelihoods and Women's Health. *International Journal of Epidemiology* 35(2): 504-505.
22. Rao P, Arcury,TA., Quandt, SA., & Doran, A (2004) North Carolina Growers' and Extension Agents' Perceptions of Latino Farmworker Pesticide Exposure. *Human Organization* 63:151-162.
23. UNICEF (2009). Gender analysis and balanced development In: [http://www.rwandagateway.org/gateway\\_new/spip](http://www.rwandagateway.org/gateway_new/spip).
24. Vermeire T, McPhail R, Waters M. (2003) Integrated human and ecological risk assessment: A case study of organophosphorous pesticides in the environment. *Human and Ecological Risk Assessment* 9(1): 343-358.
25. Yalemtehay M, Tadesse A.(2002) Effects of pesticide applications on respiratory health of Ethiopian farm workers. *International Journal of Occupational and Environmental Health*..8:35-41.
26. Woolf M. (1993) Blood Levels of Organochlorine Residues and Risk of Breast Cancer. *Journal of the National Cancer Institut*. 85: 648-652.
27. [www.fpa.org.ph](http://www.fpa.org.ph)