

Health Consequences of Rural Women's Productive Role in Agriculture in the Philippines and Other Developing Countries

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Abstract

Agriculture is central to developing countries like the Philippines and rural women contribute a substantial share of the labor that goes into this sector as food producers or agricultural workers. In the wake of numerous studies conducted worldwide about women since the United Nations' Decade for Women (1976-1984), data appear sparse on the relationship between women's work and women's health in the agricultural setting to enable policy makers and program implementors to adequately address their health needs. Thus this study aimed to determine the nature of available information in the gender literature to enable us to understand the link between women's productive farm work and their health status, and to elicit major implications for research to aid policy and program. The method used was a review and analysis of pertinent data in the research literature on agricultural women covering over two decades. Findings from the study reiterate the crucial role held by these women throughout the developing world in securing food for their families and communities, but then this role is not performed without adverse consequences to their health. The major consequences include female reproductive health risks owing particularly to women's use and exposure to hazardous agrochemicals, farm-related accidents or physical injuries, ergonomic problems resulting from women's use of tools or technology that are better suited to men, and nutritional deficiencies that are compounded by poverty and overwork. Other findings have surfaced two main research imperatives: the need for more updated and gender disaggregated national statistics on the status of agricultural women in developing societies, and the necessity for addressing various identified gaps in the women's work-and-health paradigm.

Keywords: Rural Women, Productive Role, Health Consequences, Philippines

Introduction

Women have long occupied a central place in agricultural production in developing countries, ensuring food security for their households and their communities. However, an initial analysis of the literature revealed that the importance of their role as food producers had received attention and support from both their national governments and international bodies only within the last 35 years. Scholarly interest in women was ushered in by various international activities which, spearheaded by the United Nations (UN), directed attention to the subject of women and food. Starting with the 1974 World Food Conference, women's contributions to the battle against world hunger was globally acknowledged. Through its declaration of 1976-1984 as the Decade for Women, the UN then introduced the concept of integrating *women in development* which subsequently

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became *gender in development*. The 1977 UN report “Women in Food Production, Food Handling and Nutrition” advanced these themes in the agenda of international organizations and national agencies that were oriented or reoriented to women and gender issues. It was believed, however, that the 1979 World Conference on Agrarian Reform and Rural Development provided the turning point as it underscored greater support for women’s economic roles, a methodical accounting of rural women’s contribution to agriculture, and provision for women’s equitable access to productive resources such as land, water, inputs, and services (FAO, 1981 cited in Holmboe-Ottesen, Mascarenhas and Wandel, 1989).

These early events had helped to systematically awaken worldwide concern for farm women’s welfare and inclusion in rural or agricultural development policies and programs. In their wake came funding support for rural women’s organized initiatives such as alliance-building and various projects to address their specific needs. Also generated were a tremendous research interest on farming women and more avenues (particularly international conferences) for regularly assembling, discussing, and sharing information and research findings on the current state, unmet and emergent needs, and accomplishments of rural women. Literature analysis showed that lessons from the women in development (WID) thrusts of the first two decades since 1976 firmed up a shift toward mainstreaming gender and development (GAD) in the nineties that seemed to have subsequently slacked but was revitalized in recent years.

In the course of the international call to act on rural women’s welfare, many studies have been undertaken to establish or document their baseline situation especially the nature of their needs and problems, the determinants influencing their conditions, the necessary policy reforms and action projects, and the successes and failures of national efforts to address their needs. However, one sphere that has yet to receive adequate attention is the relationship between women’s work and women’s health in the agricultural setting. There was some impetus to build a database on the subject over a decade ago but this focused on the impact of pesticides and other hazardous agrochemicals on women. Particularly in the Philippines, previous studies as well as current investigations on women’s health also tended to emphasize sectoral issues like maternal or reproductive health (see for example Chiong-Javier, 2005; Singh et al., 2003; Kantner and Wesley, 1998; Stewart et al., 1996). Moreover, while there are current researches targeting women farmers in the agricultural setting, these appear to concern non-health issues like gender roles and market participation (see for example Rodriguez, 2007).

To date, therefore, there remains some void in our knowledge about the health situation linked to rural women actively engaged in agriculture or food production activities. What kinds of information and how much of it are available to enable us to understand the connection between the productive work of agricultural or farm women and their health status? What does the information imply about the research directions in this field of interest? A literature review covering research and related publications on women in agriculture was conducted to provide some answers to these queries and to draw out major implications for further research particularly in the Philippines. Originally, I intended the review to focus only on relevant literature in the last decade, but finding inadequate sources, I expanded the coverage to earlier materials.

Agriculture and Women

Why study agriculture and women? There are three basic arguments that can be used to rationalize a research thrust on women in agriculture in developing countries like the Philippines.

One, despite inroads created by industrialization in past decades, agriculture continues to predominate in the economies of developing countries. Unfortunately, in spite of its importance to a developing economy, this sector has generally not merited adequate national attention and budgetary support. In the Philippines, around a third (32.2%; NSO, 2002) of the country's 30 million hectares is agricultural land and agriculture contributes over a fifth to the country's Gross Domestic Product (Tanzo and Sachs, 2004). Notwithstanding this fact, agriculture's annual share of the total public expenditures has been a pittance: it hardly reached 5% in the last decade (PPI, 2004; Briones, 2002). Instead, for the years 2002-2004, the annual share steadily declined from 3.61% to 2.93% (NSO, 2002) furthering the sluggish growth of Philippine agriculture. The inadequate budget has hindered the maintenance and expansion of vital agricultural services such as irrigation support and production loans (PPI, 2004). Compounded by other factors like limited access to productive resources or employment opportunities and increasing landlessness, this intensified poverty among the broad ranks of rural folks, especially the many women who depend on agriculture for their own and their family's survival. Thus the Philippines Peasant Institute (2004) has concluded that poverty is a persistently rural phenomenon in the country today, with the rural sector accounting for four out of five poor Filipino families. In a recent statement, the National Statistical Coordination Board (2008) also declared that national poverty has worsened in 2006 with 33 out of 100 Filipinos (or 4.7 million families) being poor and concentrated in the rural areas.

Two, agriculture provides work to half the world's labor force (estimated at 1.3 billion workers) and almost three-fifths (60%) of the total economically active population in developing regions compared to less than a tenth in developed countries (Forastieri, 2007; ILO, 2000). More importantly, farming persists as the sole means of subsistence or source of income for some 70% of the world's impoverished rural populations (FAO, 2003 cited in Garcia, 2004). In the case of the Philippines, Briones (2002) reported that agriculture provided subsistence, employment or income to two-thirds of the country's population. This converts to around 58.45 million people based on the 2007 total Philippine population of 88.57 million (NSO, 2007). Since agriculture is known to support three-fourths of the country's poor and about half the nation's total workforce (Briones, 2002), then it takes on an overwhelming importance to the country.

And three, women contribute a large share of the labor that goes into agriculture whether as independent food producers or agricultural workers. In developing nations, two-thirds of the female labor force is engaged in agricultural work (FAO, 2003 cited in Garcia, 2004). In terms of their proportion in the agricultural labor force, women account for 80% in Kenya, 73% in Congo, 65% in Afghanistan, and 40 or over in Zimbabwe, Latin America and the Caribbean (RAMP, n.d.; Kavoreria, 2003; ILO, 2000; Rojas, n.d.). In the Philippines, about 13.5 million women comprised the labor force in rural areas in 2004; and of the total employed women in agriculture in 2002, 51.4% were unpaid family workers, 30% were own-account workers, 18.6% were wage and salary earners (NSO, 2004).

It is said that conventional statistics often belie the true picture of the magnitude of women's involvement in agricultural activities in developing countries. According to FAO (2003, cited in Garcia 2004), although rural women are economically active, their livelihood and income-generating activities as unpaid family labor, subsistence crop producers, landless workers, agricultural traders or market vendors, and operators of micro-manufacturing enterprises are not counted in official statistics. This implies that the figures representing rural women's involvement in agricultural work are actually higher than reported ones in a country's gross domestic product. One explanation for the under-representation of women's work in agriculture is the tendency of many cultures to view women's unpaid work in family farms as a mere extension of their domestic duties (FAO, 2003 cited in Garcia, 2004). This is the context in which women are described as "invisible." Because of their invisibility, they are overlooked in agricultural development policies and programs that are generally partial towards men.

In Philippine agriculture, when compared to their male counterparts how have women farmers fared particularly after government attempts in the past decade to correct gender inequality in its agricultural policies and programs? The literature shows that it would be incorrect to say that there has been no positive increment to farm women's welfare of such attempts. But the increment seems insufficient to make a dent in their lives or to alleviate their poverty, as implied by the following data:

- *Access to land* – Women comprise only 22 % out of the total number of agrarian reform beneficiaries who received land from government reportedly after 10 years of implementing the Comprehensive Agrarian Reform Program (CARP) and four years since the issuance of a policy aimed at ensuring gender equality in land titling (PPI, 2004).
- *Access to productive resources* – Only 24.5% are women beneficiaries of the Department of Agriculture's program for rice, corn, high value crops, and livestock (PPI, 2004). An earlier study found that while major credit schemes are continuously channeled to male farmers, an increasing portion of credit funds disbursed by nongovernment organizations (NGOs) are directed to women but the loans obtained by the latter generally remain small and often lacking to increase the scale of their operations (Illo et al., 1995).
- *Access to agricultural extension services* – Only 5% of the extension services have gone to women (FAO cited in PPI, 2004).
- *Ability to influence agricultural policies as decision makers* – Women comprise only 18.5% of agricultural managers (PPI, 2004) and hold only 20% of the positions in decision-making bodies at the village level (FAO-SD, 1996).
- *Income from agricultural wages* – The average daily income of rural women wage earners is reportedly only Php23.00 (or \$0.48 at current exchange of Php48.00/dollar) which is lesser than the earning of male farm workers. A woman is said to earn only 36 centavos for every peso a man earns in the agricultural sector (PPI, 2004). While these reported figures are evidently dated, it cannot be denied that women's wages in the farming sector are way below those received by men.

Women's Productive Work in Agriculture

The economic or productive role of agricultural women is characterized by their participation in two separate yet possibly overlapping areas: (a) as hired laborers in farm-related operations of other landowners, commercial plantations, and agribusiness corporations, and (b) as farmers or family workers in owned, spouse- or family-owned, and/or leased farms.

Briones (2002) reported that women agricultural wage earners often land in low-paying, casual, piece-meal jobs. On the other hand, Rengam (1994) found that in some parts of Asia where women occupy the most subordinate roles, they are the lowest paid workers assigned to the most strenuous or hazardous tasks like mixing and applying pesticides. Engaged as hired labor in farming systems, Asian rural women including those in the Philippines generally figure prominently in transplanting, weeding, harvesting, threshing, and manual paddy processing but the males outnumber them in ploughing and non-manual or mechanized work (Swaminathan, 1998; OWID, 1997).

Various studies have shown that, as heads or members of rural farming households, women farmers are recognized for their fundamental role in producing food and thus ensuring food security for the household. Food security exists, according to Clay (2002), when family members have physical, social and economic access at all times to sufficient, safe and nutritious food which meets their dietary needs and food preferences for an active and healthy life. In Population Reports (1997), it is stated that as much as 90% of all food for home consumption is reportedly grown by women in developing countries, to wit: in sub-Saharan Africa, women grow 80-90% of all such foods; in Asia, 50-60%; in the Caribbean, 45%; and in Latin America, over 30%. Holmboe-Ottesen et al. (1986) explained that the role of African women farmers is the most documented in the literature owing to a special interest in their combined situation as paramount yet socially disadvantaged food producers. The Philippines Peasant Institute (2004) found that in the Philippine case most women farmers are in staple food production notably rice (37.36%) and corn (26.81%). However, those in rice-farming have attracted more studies because of their relative size and importance in growing the country's staple crop and the International Rice Research Institute's program of institutionalizing women's concerns in agricultural research and extension (PPI, 2004; OWID, 1997).

Women's farming roles are usually gender-differentiated--that is, certain tasks or responsibilities are handled only or mostly by the women--and may vary by crop. Philippine data show that gender division of labor is distinct but not necessarily rigid. The men traditionally undertake land clearing and preparation, except where minimum tillage is required like in home vegetable gardens, spray chemicals and fertilizers, and carry out more mechanized tasks. Women, on the other hand, supply a major part of the labor for planting, weeding, and harvesting; they are heavily engaged in post-harvest tasks such as threshing, processing, and marketing, and are increasingly involved in transporting produce to the market where transport facilities have improved (FAO-SD, 1996). Rice production in the country has long been a women's domain, hence seed selection, uprooting and transplanting of seedlings, and storing of grains are part of their major role (Garcia, 2004). Moreover, studies of women's involvement in rice and vegetable production show that the majority (93%) also spray pesticides (Rengam, 1994) and pesticide-related activities multiply in the vegetable arena (Tanzo and Sachs, 2004). In the banana and pineapple plantations of Mindanao, women are preferably hired as

ground sprayers, harvesters, canners, and packers because they “do not smoke and are easier to handle” (quotes in Sarcos, 1997). Those in coconut and sugarcane areas attend to planting and weeding while their male counterparts handled harvesting and processing like milling or making copra (Illo et al., 1995). In commercialized vegetable production, very recent data (Chiong-Javier and Catacutan 2005) reveal the women’s principal tasks to consist of planting, weeding, harvesting, and sorting the size/quality of the produce. Their husbands are mainly responsible for land preparation, spraying, staking, tying plants to stakes, hauling, and crating or “sacking” the produce. In larger farms, wives take on the added tasks of hiring, supervising, and paying the field laborers. In some notable cases, those with capital become “*biyahidors*” who buy other farmers’ vegetable produce to sell in the city market and sometimes double as small-time money lenders to obtain an exclusive right to buy the lendeer’s produce.

In relation to food production, farm women in the Philippines and other developing countries are also mainly responsible for raising poultry, swine and/or goats and collecting animal fodder, whereas tending to the carabao (water buffalo) and cattle is a male responsibility (OWID, 1997; FAO-SD, 1996). With regard to women in upland households engaged in agroforestry, apart from farming they predominate in handling vegetative contouring, planting and establishing trees, weeding, caring for trees, and selling forest products in the market (FAO-SD, 1996). Particularly in South Asian countries like Nepal and India where women spend 3-5 hours per day simply to collect animal fodder and fuelwood for cooking, growing trees assures them some supply of both fodder and fuelwood as well as cash income (OWID, 1997).

Over the past decade, some developing countries had encountered a decreasing trend in the number of their female hired labor but experienced a corresponding rise in unpaid female farm workers. In India, women lost out during the shift from cultivating labor-intensive rice crops to other cash crops requiring less female labor, but they progressively took over more farm work when male cultivators increasingly joined the market economy (Darley J. and Shanmugaratnam, 1994). In the Philippines, the rate of female employment in agriculture was reportedly declining since 1994 due to trade liberalization policies (resulting from the World Trade Organization’s Agreement on Agriculture) that dampened rural incomes to the point that family labor replaced unaffordable hired labor. Other effects were increased labor outmigration as farm women chose to work abroad and increased transfer to the non-farm informal labor sector as they became vendors, retailers, cosmetic dealers, laundrywomen, beauticians, or domestic helpers (PPI, 2004). With greater poverty, it seems that rural women are further marginalized by their absorption in unpaid agricultural activities or their move to lowly paid off-farm employment.

Health Consequences of Agricultural Women’s Work

Forastieri (2007) of the International Labour Organization described agriculture as one of the three most hazardous sectors of human activity in both developing and industrialized countries, along with mining and construction (ILO, 2000). Women’s work in the agricultural sector as farmer or wage earner is therefore not without some serious health repercussions. The literature on rural women’s health indicates that reproductive health risks, occupational accidents, and ergonomic-related problems directly stem from

the nature of the work they perform, but nutritional problems appear to be influenced by their intertwining productive and reproductive or domestic roles.

Reproductive health risks

Reproductive health has been defined as the ability of healthy women to bear healthy children with healthy men thus enabling their children to develop into healthy adults with the same capability (Ohanjanyan, 1999). This basically means freeing women from illness, disease, disability, violence, and other harmful practices related to sexuality; it also implies safe motherhood (ICPD cited in Dodoo and Ezeh, n.d.). The women's reproductive role pertains to their exclusive child bearing function and almost exclusive child rearing and home management tasks. Because of this role, investments on their reproductive health are considered to leave far-reaching implications for the health and future wellbeing of children and men as well. Reproductive health risks of women are problems that afflict their reproductive system and hinder their overall reproductive and productive capacities.

These risks may already be present when women render extremely time-consuming and heavy work under deprived economic and technological conditions in developing economies. However, numerous studies have invariably pointed to one particular work situation--women's use and subsequent exposure to pesticides and other hazardous substance--as the predominant cause. Introduced as an indispensable part of modern crop production, pesticides and fertilizers top the list of agrochemicals applied to crops, which include fungicides, herbicides/weedicides, nematocides, rodenticides, and other poisons for various crop pests or vermin. These are among the nearly three-quarters of a million chemicals and chemical compounds reported by ILO (2000) to be in agricultural use throughout the world, with many of them said to elude assessment of their potential harm to people. According to Ohanjanyan (1999), nine pesticides are in the 12 most damaging chemicals classified as Persistent Organic Pollutants (POPs) and recommended to the UN for elimination or reduction by the Women's Environment and Development Organization. These are (1) DDT or its breakdown product DDE, (2) Aldrin biphenyls, (3) Dieldrin, (4) Endrin, (5) Chlordane broad spectrum, (6) Heptachlor, (7) Hexachlorobenzene, (8) Mirex, and (9) Toxaphene (PSR monitor, 1998 cited in Ohanjanyan, 1999).

Pesticide use has become quite pervasive among farmers in developing countries as evidenced by the growth of this practice from 37-55% over a past 10-year period (1983-1993; ILO, 2000). Its popularity in the Philippines can be traced to the Green Revolution era in the sixties and seventies that introduced pesticide use as a prerequisite input to obtaining high rice yields. Boosted by available subsidies and loan schemes, farmers sprayed their fields as much as 15 times per cropping season (Tanzo and Sachs, 2004). Chemical dependence has become an acceptable norm to the extent that it is increasingly being adopted even by subsistence farmers engaged in some cash crop production in upland areas today.

While all agricultural workers are equally at risk from prolonged pesticide use and exposure, women face so-called "gender-specific" reproductive health risks. Persistent organic pollutants tend to accumulate in fatty tissues of living organisms (Ohanjanyan, 1999), making women biologically prone to their toxic effects because women possess more fatty tissues than men (Leyesa, 2004). Findings of epidemiologic and occupational

studies done mostly in the west have found that toxins stored in women's bodies increasingly predispose them to various reproductive health disorders and malignancies including hormonal disruptions or interferences in the estrogen level that alter the normal menstrual cycle, pregnancy complications, miscarriages, stillbirths, birth defects, delayed pregnancy, reduced ability to breastfeed, endometriosis, and cancer of the breasts and ovaries (Ransom, 2002; Ohanjanyan, 1999; Rengam 1994). Moreover, pesticide residues are passed on by mothers to babies through breastmilk. Studies have reported the presence of 4-12 times higher than the acceptable levels of DDT metabolites called DDE in breastfeeding infants located in developing countries like Brazil, Zimbabwe, and China (Ransom, 2002). In particular, women workers who are hands-on with pesticides even while pregnant or breastfeeding such as the banana and pineapple plantation workers in the Philippines (Tanzo and Sachs, 2004) are among those at really great risk.

In poorer agricultural societies where women work with pesticides, their situation is compounded by exacerbating factors linked to poverty and exclusion from agricultural extension programs that normally target men. In the case studies of eight Asian countries including the Philippines, Rengam (1994) reported that most women farmers and workers came in direct contact with pesticides as applicators but many could not read labels and follow instructions owing to illiteracy or low educational attainment, rendering them unaware of the adverse effects of pesticides. In that same study, Rengam found that farm women in the Philippines, Malaysia, and Pakistan narrated the ill-effects of pesticide use in quite general, vague, or hazy terms, viz., being poisoned, feeling dizzy or nauseous, having breathing difficulty, sneezing, itching, muscular pains, skin burns or blisters, nail discoloration, red or "sore" eyes, and death. The women said they failed to wear protective clothing because this was unavailable, unaffordable, unfit for the climate or unknown to them; and if resorted to, the usual means of protection was a handkerchief or cloth placed over the nose and mouth. They could not immediately remove pesticide residues off their bodies because washing facilities were absent in the field where spraying occurred. Moreover, they engaged in improper practices like mixing pesticides with bare hands or disposing of chemical leftovers and containers in home vicinities (Rengam, 1994).

Other complicating factors are the tendency to overlook the multiple kinds of activities covered under the phrase "pesticide use" and the blurred distinction between what differentiates working areas from living areas in an agricultural setting. Most often, pesticide use is understood as mere spraying or application of the chemical. However, studies like that of Tanzo and Sachs (2004) have uncovered its multiple nature especially as handled by women, i.e., mixing is a pre-application work but post-application activities range from cleaning the pesticide equipment/tank, disposing of excess pesticide mixture and used pesticide receptacles, storing unused pesticide and tank, placing and monitoring pesticide traps around the field or storage areas, and washing pesticide-soaked clothing. Even when it is the men who spray the pesticide, a number of these activities are assumed by women as part of their domestic obligations (Ransom, 2002). Moreover, in agriculture there appears to be no sharp distinction between living and working conditions so much so that pesticide containers are easily misused or recycled as food and water receptacles and pesticide leftovers are dumped in the backyard, exposing families to contamination (ILO, 2002).

Occupational accident

Because agriculture is one of the most hazardous occupational sectors, Forastieri (2007) estimated that over 51% (170,000) of the total of 335,000 fatal workplace accidents worldwide are comprised of agricultural workers, with the highest frequency and fatality rates of injury or mortality being caused by farm machinery or non-chemical occupational accidents. Unlike those in other work sectors, therefore, agricultural workers run twice the risk of dying on the job (Ransom, 2002). In addition, mortality rates in agriculture have not stopped rising in the industrialized and developing countries, compared to the mining and construction sectors where the trend is declining. The increasing numbers of mechanical, ergonomic, biological and chemical hazards are said to be the main causes of high incidences of accidents, physical injuries, and occupational diseases (ILO, 2002).

In developing countries, both female and male workers are at risk because of usually inadequate education, training, and safety or protective mechanisms. But Tanzo and Sachs (2004) claimed that the women face higher risks in those societies where their use and exposure to chemicals are greatest and where they are forced to increasingly take over the tasks vacated by men who migrate to seek off-farm employment in the cities and leave the farming to their wives. Other than this account, not much empirical data was available in the literature to determine the impact of agriculture-related accidents or physical injuries on women per se.

Ergonomic-related problems

Current ergonomic research in developing countries is said to be focused mainly on the industrial sector and not in agriculture (Forastieri, 2007). Nevertheless, ILO (2002) has pointed out that the transfer of western technologies carries ergonomic implications for their users in developing countries because imported technology is oftentimes inappropriately designed for the climate and other environmental features, organizational aspects, working conditions, cultural habits, or workers' physical strength, body size and measurements found in the recipient country. Thus when women are beneficiaries of such technology, there is the added fact that the technology may be designed or intended more for male use. For instance, agricultural equipment, implements or tools for land preparation, ridging and weeding, crop threshing, cooking stoves, and water transporting are generally large, bulky, heavy, and difficult to manage and operate for women especially in Asia. Adopting inappropriate tools could lead to posture, spine, and musculoskeletal problems, or worse, to accidents and physical injuries (ILO, 2002).

Although the literature has very limited information on the ergonomic-related problems of agricultural women in developing countries, there are findings in Africa that demonstrate the adverse effects of ill-suited technology on offspring. Holmboe-Ottesen, et al. (1989) noted that pregnant women who operate heavy farm tools consequently experience a lower infant survival rate than those who work with lighter tools. The development of gender-adapted or women-friendly technologies for transplanting, seeding, and milling in the rice production system may be viewed as a tacit recognition of the existence of ergonomic problems that not only affect women but may also boomerang on children. Besides, experiences with adopting women-appropriate technology have illustrated the additional benefits of shortened work hours or reduced labor input that free women from farm work to attend to other domestic responsibilities (OWID, 1997).

Nutritional problems

Findings from the UN-commissioned comprehensive literature review of studies in Africa and Asia conducted over a decade-and-a-half ago provide interesting insights on the nutritional consequences of women's work in agricultural food production (Holmboe-Ottesen, et al., 1989). Other than these, recent empirical information has yet to be found that directly addresses how women's farm workload can affect their nutritional status. In the UN study, "nutritional status" referred to women's health condition that is affected by their consumption of food and utilization of nutrients. The direct means of determining this is through the use of anthropometric measurements of weight, height, and arm circumference or growth patterns based on these measurements, clinical symptoms and physical signs of malnutrition, and biochemical or laboratory measurements of body nutrients and constituents.

Owing to limited information based on such direct measures, the UN study utilized what can be called "proxy indicators" to arrive at some conclusions about women's nutritional conditions. These proxy measures are as follows (Holmboe-Ottesen, et al., 1989).

- Children's birth weight – Low birth weight is reflective of the mothers' heavy workload and poor nutritional health at the time of pregnancy. Studies in India, Ethiopia, and Gambia confirm the relationship between high workload and low birth weight.
- Energy expenditures of both women and men - Calculated from time-allocation studies, when women put in longer work hours within a given period compared to men then they expend more energy that consumes nutrient intakes. On a yearly basis, African women average 8-10 hours of work per day but this can rise to 15 hours daily during the peak agricultural season. Combining low food intake with high workload creates an energy deficit that is detrimental to women's nutritional status.
- Women's work pattern during and right after pregnancy – In most agricultural societies, women continue to assume full duties until the onset of labor and return to full work between one day and 2 weeks after delivery. This is a prevalent work pattern noted in a cross-cultural study involving 202 societies.
- Women's weight during peak and off-peak periods and at pregnancy – A study in Gambia shows that farm women gain 5.5 kg during the off-peak period but only half of this weight is attained in the peak of the agricultural season. In Ethiopia, pregnant women engaged in laborious tasks during the peak season only put on 3.3 kg while the less active ones have a higher weight gain of 5.9 kg. Women's strenuous physical activity results in weight loss for self and unborn child.

It is evident from the aforementioned findings in the UN study by Holmboe-Ottesen, et al. (1989), that the enormity of women's workload in the farming sector of developing countries does impact negatively on the nutrition of both women and their families. In view of the fact that women bear the brunt of most responsibilities associated with

cooking the family's meals, it is understandable that the heavier their farm work is the lesser time they have for food preparation that leads to a poorer household diet. In times of food scarcity, women's nutrition suffers the most for in most societies they tend to sacrifice their own nutritional requirements to satisfy those of children and spouses. Finally, it is said that if a shorter time for food preparation were combined with peak agricultural season and low food availability, the consequences could be fatal for the family's nutritional status because family meals will be fewer in quantity, lacking in variety, and less well prepared (Holmboe-Ottesen, et al., 1989).

Implications for Research Especially in the Philippines

My review and analysis of available empirical literature for this study has underscored a general lack of current research and publications on women in agriculture that explain the link between their work and their health. The bulk of available studies on agricultural women were conducted in the eighties up to the mid-nineties, or within the first 20 years following the start of the UN Decade for Women in 1976. Obviously, the then availability of research and program funds that supported global interest in agricultural women spurred the compilation of data in developing countries. Between the mid-nineties and the mid-2000s, interest in investigating the impact of agriculture on women's health seemed to have waned if the number of sources available for review could be used as a gauge.

In the Philippines, however, globalization and trade liberalization issues in the last five years have refocused attention on farm households including women farmers and how they are negatively affected by such issues (see for example Spieldoch, 2007; LWR et al, 2004). The adverse impact of world trade is not a new discourse in the country because women advocacy groups like the Asian Peasant Women Network and the Federation of Peasant Women in the Philippines had already written about this issue in the late nineties. According to Sarcos (1997), economic policies imposed by international trade relations had intensified the exploitation of farm households, caused greater landlessness and impoverishment with the conversion of agricultural lands, shifted production to high value crops that necessitated intensive chemical use, opened the country to cheaper agricultural imports that competed with local products, and forced farm women to labor more or move to lowly paid off-farm jobs that compromised their welfare, among other problems.

Moreover, the role of women farmers in rural development particularly in Asia has been widely discussed again since an international seminar on the topic was held in Korea in 2007 (ASIADHRRA, 2007). The plight of rural women has also received international attention in 2008 when a major research granting institution--the Bill and Melinda Gates Foundation--made public its strategies of investing in agricultural women and gender mainstreaming to advance global development, fight hunger and end extreme poverty (Bertini, 2008). All these renewed interests in agricultural women could be expected to lead to newer studies and evidences for us to better understand the women's work-and-health paradigm.

Meanwhile, what research implications can be derived from my study? Findings from the review indicated varied issues that can be grouped under the following two broad research imperatives for local researchers.

1. *Continuing need for updated and disaggregated statistics.* In the course of review, I found many antedated national statistics on such crucial information as the proportion of women in the agricultural workforce, their income from agricultural wages or paid farm work, the number of female beneficiaries of the major programs and extension services of the Department of Agrarian Reform and the Department of Agriculture, and the extent and nature of rural women's participation in local organizations. Publications after the turn of the century in 2000 presented figures that were quoted and re-quoted from earlier UN studies or materials considered as landmark sources by later researchers such as the 1986 NCRFW publication on Filipino women and the 1995 UN study of Illo et al. Thus data mentioned in more recent articles are repetitions of information in published sources that are at least two decades old. I am aware that by citing the same dated information in this paper I may also be passing on old data to future researchers.

This problem may be due to the lack of current baseline studies and the continuing lack of gender-disaggregated data in spite of recent conscious efforts in this direction. Although they are an expensive endeavor, baseline studies and comprehensive literature reviews are needed periodically for monitoring developments and assessing accomplishments over a time frame. There was much research interest accompanying the end of the Women's decade in the mid-1980s and 10 years later in the mid-1990s, but this was not visible by end of the third decade although there was a peaking of interest after 2005.

While UN and national agencies have played a pivotal role in providing updated and disaggregated statistics, the work of individual researchers can also contribute to easing the problem. They can subject voluminous unreported data collected by the National Statistics Office or the Bureau of Agricultural Statistics to secondary, gender-sensitive data analysis. But unfortunately, researchers who have attempted to conduct this kind of analysis find that their work continues to be severely limited by the presence of mostly aggregated information. One reason for the persistence of aggregation appears to be economically related because collecting and processing disaggregated statistics can have added costs for government. Another reason could be traced to the fact that not many government researchers are truly gender sensitized and able to apply this sensitivity to their task.

2. *Need for current studies particularly on identified research gaps.* Another way to provide updated data is to conduct new research on previously identified gaps or old issues. In relation to the women's-work-and-health paradigm, the major research gaps that surfaced in this study are primarily the following.

- Studies on farm women's reproductive health and nutritional concerns can include determining the reproductively hazardous farm activities of rural women, the types of morbidity and mortality risks manifested among older and younger women (especially pregnant and lactating mothers) in a chemical-intensive production area like a rice or vegetable farming community, the major risk factors (including pesticide use) in the reproductive health of mothers and girls, the downstream effects that persistent pesticide use in upland production systems have on the health and environment of lowland communities,

the lessons from women farmers' adoption of organic farming and integrated pest management as alternative practices, and their nutritional deficiencies as these relate to available food supply for the household and personal food consumption habits.

- Research focusing on the changes in composition and dynamics of farm households and their farming practices in the wake of global trade agreements can cover such questions as: To what extent has female and male out-labor migration affected the leadership, organization of work for food production especially involving adolescent girls, and assurance of food security in depressed farming households? How has the production of cash crops like vegetables in the hilly lands altered upland women's productive and reproductive roles? How have the altered gendered farm roles of women and men been beneficial or disadvantageous for mothers and their children? What changes in crop preferences or farming system practices have adversely affected women farmers?
- Documentation of the impact of externally introduced technologies on the workload, health and overall wellbeing of rural women is necessary in view of findings that these technologies often place women at a further disadvantage. For example, how are introduced technologies such as low-cost drip-irrigation and no-tillage adapted to local conditions and made ultimately advantageous to women farmers? Ergonomic-related problems of rural women resulting from ill-fitting technology should likewise be studied. For instance, because women are active in postharvest activities it is important to investigate what postharvest technologies they have been introduced to, the gender-appropriateness of such technologies, the women's reasons for adoption or rejection, and the benefits they derive from technology use.
- The analysis of rural women's organizations as a concrete articulation of their empowerment is sorely needed. After the Women's Decade, many foreign and local agencies assisted farming women to establish their own organizations that launched livelihood, education, health, and other projects to better their lives. Their organized efforts were usually documented and analyzed as case studies. Today, there is hardly any literature or updated studies that analyze the broader impacts of these organizations on advocating gender-fair policies and programs for women in the country, on petitioning for members' access to land, credit, and other productive inputs, on lobbying against measures (such as on mining) inimical to their interest, and on the adoption of soil and water conservation, the current state of such organizations, the characteristics and accomplishments of similar organizations created recently, and the collective profile of their women leaders or membership. Information on these aspects is valuable to understand and capitalize on the factors that boost women's empowerment.

- The health situation of women agricultural extension workers and farm researchers as this relates to their work likewise merits some research attention. For instance, how many of our extension workers and researchers are women themselves and what kinds of occupational health risks do they face? It should be important to note if they are also exposed to the same health risks as the female farmers they assist.
- And finally, apart from investigating the apparent gaps in the research on women in agriculture, there may be a need to explain why such gaps have occurred. Are research gaps created when international research donors withdraw their support for certain areas of studies or shift their research agenda? How politicized are the fields of agriculture and health and how can this ease or aggravate the situation of rural women? What role does politics play in bridging research gaps on women's health?

The research issues raised in this paper should be the collective concern of government instrumentalities like the National Statistics Office and pertinent line-agencies, academic research institutions, and nongovernment organizations that are depositories of rural grassroots information in the country. Many of the proposed studies are usually better conducted by a collaborative team consisting of social, health, and environmental scientists who are grounded in their own fields but who recognize that contributions from other disciplines can help them transcend their theoretical and methodological limitations in approaching a given phenomenon. It is vital to address the research imperatives raised in this study for only in doing so can we be in possession of the information that are needed for sound agricultural policy making and program planning to significantly advance the economic, social, and physical wellbeing of agricultural women. The improvement in the lives of these women who hold the key to their family's food and health security through their productivity may even be a way to eventually alleviate poverty in the rural areas of our country.

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