



Gender Roles in Root and Tuber Crops Production in Northern Philippines

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Abstract

Literature provides evidence that gender-specific analysis of agricultural production can improve system performance. This study documents and examines the gender division of roles and responsibilities in root and tuber crops production among indigenous peoples in the Northern Philippines using secondary data, focus group discussions with 83 men and 101 women farmers, field visits, and direct observations. The study covered 11 provinces and 13 indigenous communities: *Ibalois*, *Kankana-eyes*, *Applai-Kankana-eyes*, *Kalanguyas*, *Isnegs*, *Biga-Kalingas*, *Masadiit-Tingguians*, *Iyattukas*, *Ivatans*, *Bagos*, *Bugkalots*, *Aetas*, and *Buhid-Mangyans*, as well as the *Kapampangans* and *Ilocano* rootcrop farmers in Central Luzon. Gender roles and gender division of labor are mostly similar among selected ethnolinguistic groups in different landscapes. Women's labor participation with men in land preparation is higher in swidden farming, rainfed sloping field, and dry land, which are unfavorable environments. Men dominate activities that require physical strength such as land preparation, spraying chemicals, and hauling of inputs and harvested crops. Women in subsistence and small farms participate more in field activities. Also, in indigenous groups, women are traditionally exposed to physical labor compared with those in irrigated areas, wherein the farming households are better off. Results also revealed that men dominate crop maintenance in commercial production of rootcrops among *Kapampangans* and *Ilocanos*, but not for Benguet wherein both men and women almost equally execute potato production activities. Findings imply that policy and development workers can capitalize on the active indigenous women labor participation in matters related to root and tuber crops production as a strategy for food security.

KEYWORDS

rootcrops
gender
production
indigenous knowledge

Introduction

The indigenous peoples of Northern Philippines like the *Ivatans*, *Isnegs*, *Biga-Kalingas*, *Masadiit-Tingguians*, *Applai-Kankana-eyes*, *Bagos*, *Kankana-eyes*, *Iyattukas*, *Ibalois*, *Kalanguyas*, *Bugkalots*, *Aetas*,

and *Buhid-Mangyans* consider roots and tubers as their staple in the olden times. With the changing lifestyle of the younger generation of indigenous people and the limited documentation of indigenous knowledge on roots and tubers, the

production of root and tuber crops is fast declining. For example, the production of sweetpotato in the Cordillera region decreased by 16.45% between 2014 and 2018 (Philippine Statistics Authority [PSA], 2019). This situation is brought about by out-migration and employment of young adults, the introduction of high value crops, climate change, environmental degradation, and diseases wiping out sweetpotato, greater yam, and taro (Gayao et al., 2017). Moreover, the trend towards increasing the cultivation of cash crops in swiddens, which has been driven by the growing involvement of indigenous communities in the cash economy, and the shift in many cases towards conversion of swiddens into permanent or dry field agriculture, has led farmers in many hill locations to pay increasing attention to potato (Prain & Naziri, 2020).

Indigenous people engaged in root and tuber crop production practice mixed cropping under different land-use systems. In resource-poor indigenous farming systems, family members, male and female, provide the labor in root and tuber crops (RTCs) production. Although the significance of women in RTC production has long been recognized, their labor contributions have often been undervalued.

Rural women are major contributors to the economy, both through their remunerative work on farms and through the unpaid work they traditionally render at home, on the farm, and in the community (Paris & Rola-Rubzen, 2019). Evidence has mounted over the past decade that gender-specific analysis of agricultural production can contribute significantly to improving system performance (Velasco, 1991). It is now recognized that development projects can appropriately intensify economic change and move in the desired directions if they address gender issues, particularly women's lack of access to resources, technologies, services, and information. Also, there is a need to provide women farmers with opportunities that can enhance their potential abilities to improve food security, increase income, and resilience in times of climate and financial stresses. Thus, mainstreaming gender in any development intervention has become mandatory. Promoting the production and use of rootcrops will potentially bring women more actively into the process of socioeconomic development and thus enhance gender equity (Castillo et al., 1991 as cited by Paris, 2002).

Gender roles are roles that women and men play, which are not determined by biological factors but by the socioeconomic and cultural environment or situation (Ogato et al., 2009; Paris, 2002). Different types of activities and tasks are generally allocated to women and men within the family in terms of subsistence and market productions. The productive and reproductive roles of females in society, termed as "double-day" roles, results in a heavier workload for females than males, although this also depends on social class, age or ethnicity group (Ogato et al., 2009).

The study documented and examined the roles and responsibilities of men and women in root and tuber crops production, specifically on land preparation, planting, crop maintenance, and harvesting.

Methodology

Data presented in this study were obtained from a bigger completed project on the "Role of Roots and Tubers in Household Food Security and Income of Indigenous Peoples in the Philippines" (Gayao et al., 2013-2014; Gayao et al., 2018). The fieldwork for the main research started from February 2012 to October 2013 although follow-up inquiries and integration write-up extended beyond 2017. Qualitative information were taken from 184 (83 male and 101 female) key informants from 11 provinces or from 13 selected indigenous peoples (*Ibalois, Bagos, Aetas, Ivatans, Isnags, Buhid-Mangyans, Biga-Kalingas, Bugkalots, Kalanguyas, Masadit-Tingguians, Iyattukas, Kankana-ays, Applai-Kankana-ays*) and the two major ethnic groups of *Kapampangans* and *Ilocanos* (Table 1). The data were gathered using focus group discussions, field visits, and direct observations.

Gender analysis is an analytical tool in studying the different and complementary roles of men and women. Gender analysis was done through the activity profile tool. This tool identifies all relevant productive and reproductive tasks (what men and women do, and where and when these activities take place) by asking 'Who does what?', so that technology development can be appropriately structured to take into account the activities, resources and preferences of actual users whether male or female (Candida et al., 1999; Paris, 2002). In addition, Mudege et al.



(2016) cited that through gender analyses, it becomes possible to show that men and women may have separate, yet interdependent spheres of activities that shape and determine women's access to agricultural technologies and other services to support their productive as well as reproductive activities.

The tool was used for the investigation of the gender roles, however, the study focuses only on the gender division of labor in cultural management techniques on root and tuber crop production, i.e. land preparation, planting, care and maintenance, and harvesting.

Results and Discussion

The gender division of labor in RTC production varies depending on the types of root and tuber crops grown, types of landscape, by ethnolinguistic classification, and degree of market orientation. The following section discusses the gender division of labor based on these determinants.

Gender Division of Labor by Type of Root and Tuber Crops

The root and tuber crops planted by all the 13 IPs selected in this study are *kamoteng kahoy* (cassava), *camote* (sweetpotato), *ubi* (greater yam), *gabi* (taro), *tugui* (lesser yam), and *galyang* (tannia). *Uraro* (arrowroot) is not among the crops

Table 1

Ethnolinguistic Groups, Location and Number of Key Informants

Ethnolinguistic Groups	Study Sites	Sex		Total no. of Key Informants	%
		Male	Female		
1 <i>Ibalois</i>	Tuba, Benguet	1	2	3	2
2 <i>Bagos</i>	Sugpon, Ilocos Sur	6	2	8	4
	Sudipen, La Union	2	1	3	2
3 <i>Aetas</i>	Porac, Pampanga	12	3	15	8
	Bamban, Tarlac	6	10	16	9
4 <i>Ivatans</i>	Basco, Batanes	1	3	4	2
5 <i>Isnegs</i>	Conner, Apayao	2	13	15	8
6 <i>Buhid-Mangyans</i>	San Jose, Occ. Mindoro	11	2	13	7
7 <i>Biga-Kalingas</i>	Tanudan, Kalinga	1	13	14	8
8 <i>Bugkalots</i>	Belance, Nueva Vizcaya	9	3	12	7
9 <i>Kalanguyas</i>	Ambaguio, Nueva Vizcaya	8	24	32	17
10 <i>Masadiit-Tingguians</i>	Bucloc, Abra	3	7	10	5
11 <i>Iyattukas</i>	Asipulo, Ifugao	-	4	4	2
12 <i>Kankana-eyes</i>	Sagpat, Kibungan, Benguet	3	7	10	5
13 <i>Applai-Kankana-eyes</i>	Bauko, Mountain Province	-	5	5	3
14 <i>Kapampangans</i>	Porac, Pampanga/Capas, Tarlac	10	1	11	6
15 <i>Ilocanos</i>	Paniqui, Tarlac	8	1	9	5
TOTAL		83	101	184	100



planted by the *Ivatans*, *Bugkalots* and *Iyattukas*; potato only by the *Kankana-eyes*, *Applai-Kankana-eyes*, and *Ibalois* (among *Applai-Kankana-eyes* potato is not known as a rootcrop but more considered as a vegetable cash crop in the locality); yacon only by the *Ibalois* and *Kalanguyas*; wild yam bean only by the *Applai-Kankana-eyes*. Arrowroot, lesser yam, and tannia are sometimes volunteer crops, while canna, aerial yam, and wild species of taro like *bitajon* are domesticated. The *Kapampangan* and *Ilocano* farmers grow cassava, sweetpotato, and yam bean in large areas in Central Luzon.

Based on gender division of labor by type of root and tuber crops, the men do most of the activities which require physical strength, such as spraying chemicals, irrigating the field, and staking while the women participate in the rest

of the activities (Table 2). Similarly, Adion (2002) reported that both men and women participate in sweetpotato production activities in Central Luzon, except in land preparation, except in land preparation, cutting of vines, digging, plowing, and hauling, which are solely undertaken by men because the farm implements used are generally manual and carabao-driven. However, Bertuso (2019) pointed out that a different pattern can be seen in labor participation by gender in sweetpotato production in subsistence-oriented communities in Eastern Visayas. All family members help in land preparation, but in land clearing, hired females also participate along with male and female family members. Female children do not participate in land clearing. Both male and female family members participate in planting. Weeding is predominantly done by female family

Table 2*Gender Division of Labor in Root and Tuber Crops Production*

Activities	Greater Yam	Sweetpotato	Cassava	Taro	Tannia	Lesser Yam	Arrowroot Canna/Yacon Yam Bean
Land Preparation							
Spraying	M	M					
Digging/Tillage	M		MW	FC	MW	MW	MW
Plowing		M	M		M		MW
Harrowing		M	M				
Leveling/furrowing of the plot		M	M				
Planting	MW	MW	MW	MW	MW	MW	MW
Crop Maintenance							
Weeding/cleaning	MW	MW	MW	MW	MW	MW	MW
Fertilization							
Irrigation		M	M				M
Side-dressing, hilling-up		MW		MW			
Staking	M					M	
Fencing							
Harvesting							
Harvesting, washing, cleaning, sorting, packing	MW	MW	MW	MW	MW	MW	MW
Hauling	MW	MW	MW	MW	MW	MW	MW
Marketing	W	MW	MW	MW	W	W	W

Legend: M – Men; W - Women; MW – Both Men and Women; FC - Family Labor with children



members, with the assistance of male family members and hired male and female workers. Harvesting is mainly a family task with the help of male hired workers. The same author also mentioned a slight difference in the labor participation of men and women across the market-oriented and subsistence-oriented households in taro production. In addition, Bertuso (2019) cited that in Northern Leyte and Southern Leyte, the husbands or male heads of households are the regular workers, except in selling the products, which is done by the wives or female household heads. The wives help their husbands in most of the tasks. The male children are more involved in taro production while the female children never assist in any of the taro production activities.

Koirala et al. (2015) reported that in the Philippines, female-headed farm households have been increasing due to widowhood and social changes such as the migration of males, awareness of gender equity in society, and the rise in female labor force participation rates.

Gender Division of Labor by Type of Landscapes

The diversity of root and tuber crops are grown and cultivated in various landscapes, depending on the production system of the indigenous peoples (Table 3). These are: a) swidden field or commonly called *uma* or *gasak/lali* (Aeta), *tamnan* (Buhid-Mangyan), *kuman* (Isneg), *inum-an* (Kalanguya) or *habal* among *Iyattuka*; b) rainfed sloping field or commonly called *bangkag* or *salud-uran* in Pampanga; c) irrigated rice field or *pajaw* (Bugkalot), *payaw* (Biga-Kalinga), *payew* (Ibaloi and Applai-Kankana-ey), *talon* or *tal-talon* (Ilocano/Bago and Masadiit-Tingguian), *paranuman* or *palayan* (Kapampangan), *mah-ma* (Isneg) and *payoh* among *Iyattuka*; d) vegetable garden or called *inuged* among *Bugkalots*; e) parcels of land or *asakatakey* among *Ivatan*; f) river bank or *sebba-karayan* (Bago); g) dry land or *dulyah* -dry land within the rice field perimeter among *Iyattuka*; h) backyard/home garden or *amtaden* (Bugkalot), *baeng* (Ibaloi), *mulaan* (Kapampangan), *amwag* (Isneg), *baangan* (Kankana-ey, Kalanguya, and Applai-Kankana-ey) or *ligligan* among the *Iyattuka* of Ifugao. Furthermore, *inum-an*, *bangkag*, and garden among the *Kalanguya* refers to the same area but distinguished according to crops planted.

In general, the gender division of labor is similar across the different landscapes, except in the root and tuber crops production in the riverbank, dry land, and backyard or home garden. Men mostly do the land preparation activities (slashing, cutting and burning of shrubs and clearing, digging or plowing, harrowing, leveling), spraying chemicals and hauling of inputs, and harvested crops. Spraying of herbicide three weeks before planting is also done nowadays by some rootcrop farmers, as they learned this technology from the television commercial (Gayao et al., 2013-2014). However, both men and women share their labor in the planting of rootcrops in different landscapes. Women dominate the weeding and harvesting activities. Children also help in the field activities if they are available (not in school). Sim and Meldoz (2002) reported that women's participation in sweetpotato production activities in Aringay, La Union is different in a swidden area. Men do all production activities in the swidden farm, while women are only involved in planting and marketing. But in the case of female-headed households, they handle everything except those farm activities beyond their ability and strength.

Gender Division of Labor by Ethnolinguistic Groups and Degree of Market Orientation (Commercial or Subsistence)

The women's labor participation in field activities among indigenous groups is higher than men's (Table 4). Although land preparation requires physical strength, women (wives) and children help the men in land preparation (mainly clearing lands for cultivation), slashing, cutting, and burning trees. However, female family members among *Aetas*, *Ivatans*, *Buhid-Mangyans*, and *Isnegs* provide more labor in slash and burn systems than in the lowland areas. Ganga and Posa (1996) find that in subsistence production of sweetpotato in Benguet, the women are responsible for the crop from planting to harvesting, with the help of their younger children. The men were involved only during land preparation. However, at busier times, labor may be shared by the couple.

Applai-Kankana-ey women of Bauko, Mountain Province do the clearing, planting, weeding, and application of fertilizer. Herbicide spraying before planting, digging, plowing, harrowing, irrigation, and hauling during harvesting are responsibilities



Table 3

Gender Division of Labor in Root and Tuber Crops Production Activities in the Different Landscapes in Northern Philippines

Activities	Swidden field	Rain-fed Sloping Field	Irrigated Rice Field	Vegetable Garden	Parcels of land	River bank	Dry land	Backyard/Home Garden
Land Preparation								
Scouting area	M							
Slashing/ burning/ clearing/cutting/weeding	MW	MW	M	M	M	W	MW	W
Spraying	M	M	M					
Digging/Tillage	MW	MW		M	W	W	W	W
Plowing		M	M		M			
Harrowing		M	M		M			
Leveling/furrowing of the plot		M	M	M				
Planting	MW	MW	MW	MW	MW	W	W	W
Crop Maintenance								
Weeding/cleaning	MW	MW	MW	MW	W	W	W	W
Fertilization			MW	MW				
Irrigation			M	M				
Side-dressing, hilling-up		MW	M	MW	W			
Staking	MW							
Fencing	M							
Harvesting								
Priming/one-time harvest	MW	MW	MW	MW	MW	W	W	W
Collecting, cleaning & sorting	W		MW		W	W	W	W
Hauling	MW	MW	M	MW	MW	W	MW	W

Legend: M – Men; W - Women; MW – Both Men and Women; FC - Family Labor with children

of men. Both men and women of the ethnic groups are involved in planting, harvesting, and hauling, but the bulk of the work is delegated to the women especially in the selection of planting materials. This result is similar to Sim and Meldoz (2002) study that the involvement of women in sweetpotato production activities among *Ilocano* farmers in La Union is almost the same as that of men. Preparation and maintenance of 'patamian' is a man's job, while gathering of planting materials, fertilization during planting, transporting, and marketing are the main activities of the women. In addition, the husband, wife,

and children help each other during planting. However, women of *Bugkalots*, *Bagos*, *Iyattukas*, and *Applai-Kankana-ays* do the harvesting and hauling activities. Among *Aetas*, all tasks are done by family members.

Gender Roles by Ethnolinguistic Groups and Type of Root and Tuber Crops

Among the selected ethnolinguistic groups, both men and women of *Ibalois*, *Biga-Kalingas*, and *Bugkalots* were engaged in all root and tuber crops production activities (Table 5). However,





Table 4

Gender Division of Labor in Root and Tuber Crops Production by Farm Activity, by Ethnolinguistic Groups

Activities	Bugkalot	Ibaloi	Biga-Kalinga	Aeta	Ivatan	Buhid-Mangyan	Bago	Isneg	Masadit-Tingguian	Kanka-na-ey	Kalanguya	Iyat-tuka	Applai-Kanka-na-ey	Ilocano-Kapampangan
Land Preparation														
Scouting area					M									
Slashing/burning/clearing/cutting/weeding	MW	FC	MW	FC	M	M	FC	M	FC	FC	FC	MW	W	
Spraying (Herbicide)		M	M			M	M	M						
Digging/Tillage	MW	M	M	FC	W	M	FC	M	M	M	M	MW	M	M
Plowing														
Harrowing														
Leveling/furrowing of the plot														
Planting														
Crop Maintenance														
Weeding/cleaning	W	MW	MW	FC	MW	MW	W	W	MW	MW	MW	W	W	M
Fertilization														
Irrigation														
Side-dressing, hilling-up														
Staking	M	MW		FC	M		MW	W						
Fencing														
Harvesting														
Priming/one-time harvest	MW	MW	MW	FC	MW	MW	W	W	W	MW	MW	W	W	MW
Collecting, cleaning & sorting	MW	MW	MW	FC	MW	MW	W	W	W	MW	MW	W	W	MW
Hauling	MW	MW	MW	FC	MW	MW	M	W	MW	MW	M	W	FC	M

Legend: M – Men; W – Women; MW – Both Men and Women; FC – Family Labor with children

Table 5

Summary on the Roles of Men and Women in Planting, Care and Maintenance, and Harvesting by Different Root and Tuber Crops and Ethnolinguistic Groups in Northern Philippines

Type of Rootcrops/ Activities	Ibalois	Biga- Kalingas	Bugka- lots	Kala- nguyas	Isnegs	Kanka- na-eyes	Masa- diit-Ting- guians	Iyat- tukas	Appalai- Kanka na-eyes	Bagos	Ivatans	Buhid- Mangyans	Aetas	Ilocano/ Kapam- pangans
Greater Yam														
Planting	MW	MW	MW	MW	MW	MW	W	W	-	FC	FCH	FC	FC	-
Care and Maintenance	MW	MW	MW	W	W	-	W	W	-	MW	W	FC	FCH	-
Harvesting	MW	MW	MW	MW	W	MW	W	W	-	MW	W	MW	FC	-
Sweetpotato														
Planting	MW	MW	MW	MW	MW	W	W	W	W	FC	FCH	FC	FC	FCH
Care & Maintenance	MW	MW	MW	W	W	-	W	W	W	MW	W	FC	FCH	M
Harvesting	MW	MW	MW	MW	W	MW	W	W	W	W	W	MW	FC	FCH
Casava														
Planting	MW	MW	MW	MW	MW	W	W	W	W	FC	FCH	FC	FCH	M
Care and Maintenance	MW	MW	MW	W	W	W	W	W	W	MW	W	FC	-	M
Harvesting	MW	MW	MW	MW	W	W	W	W	W	MW	W	MW	FC	FCH
Taro														
Planting	MW	MW	MW	MW	MW	MW	MW	W	W	FC	FCH	FC	FC	FCH
Care and Maintenance	MW	MW	MW	W	W	MW	W	W	W	MW	W	FC	FCH	M
Harvesting	MW	MW	MW	MW	W	W	W	W	W	MW	W	MW	FC	MW
Tannia														
Planting	MW	MW	MW	MW	MW	-	W	W	W	FC	FC	FC	FC	-
Care and Maintenance	MW	MW	MW	W	W	-	W	W	W	MW	W	FC	-	-
Harvesting	-	MW	MW	MW	W	-	W	W	W	MW	W	MW	FC	-

Legend: M – Men; W – Women; MW – Both Men and Women; FC or FCH – Family Labor with children and/or Hire



Table 5 continuation...

Type of Rootcrops/ Activities	Ibalois	Biga- Kalingas	Bugka- lots	Kala- nguyas	Isnegs	Kanka- na-eyes	Masa- diit-Ting- guians	Iyat- tukas	Applai- Kanka na-eyes	Bagos	Ivattans	Buhid- Mangyans	Aetas	Ilocano/ Kapam- pangans
Lesser Yam														
Planting	MW	MW	MW	MW	MW	-	W	W	-	FC	FCH	-	-	-
Care and Maintenance	MW	MW	MW	W	W	-	W	W	-	MW	W	-	-	-
Harvesting	MW	MW	MW	MW	W	MW	W	W	-	W	W	-	-	-
Arrowroot/Canna/ Nami/Yacon/Yam Bean/Wild Yam														
Planting	MW	-	-	W	-	-	W	-	W	-	-	-	F	FCH
Care and Maintenance	-	-	-	W	-	-	W	-	W	-	-	-	-	M
Harvesting	MW	-	-	W	-	M	W	-	W	-	-	-	-	MW
Potato														
Planting	-	-	-	-	-	MW	-	-	-	-	-	-	-	-
Care and Maintenance	-	-	-	-	-	MW	-	-	-	-	-	-	-	-
Harvesting	-	-	-	-	-	MW	-	-	-	-	-	-	-	-

Legend: M – Men; W – Women; MW – Both Men and Women; FC or FCH – Family Labor with children and/or Hire

among the *Masadiit-Tingguians*, *Iyattukas*, and *Applai-Kankana-eyes*, only women carried out all of the farming activities in yam, sweetpotato, cassava, taro, tannia, lesser yam, and other minor rootcrops. This situation happened especially among the *Masadiit-Tingguians* women who are widows or whose husbands are employed and children are in school. Sometimes, men family members or hired laborers are employed, especially in digging. For this reason, only subsistence/small area for RTCs is operated. Men usually work in the rice field since rice cropping is the main activity, and RTC production is done after they have planted their rice field. The men regarded these crops as women's crops or secondary crops because they complement the major crops like rice and other cash crops that are mainly market-oriented. In agriculture value chains, women are predominantly active in a subsistence economy and food for family consumption, whereas men primarily focus on cash crops (Food and Agricultural Organization [FAO], 2018). It is also noted that both men and women equally share in the task of planting taro among *Masadiit-Tingguians*.

Planting, crop maintenance, and harvesting of the crops is a work for the family among *Aetas* and *Buhid-Mangyans*. But for *Buhid-Mangyans*, both men and women do the harvesting. Among *Ivatans*, planting greater yam, sweetpotato, cassava, taro, tannia, and lesser yam is jointly done by family labor (with children) or hired labor or a task of men and women among *Isnegs*, while crop maintenance and harvesting are done only by the women.

In commercial root and tuber crop production among *Kapampangans* and *Ilocano*, labor for planting of sweetpotato, taro and yam bean is provided by family labor with children and hired labor, except in cassava where only men do planting. Harvesting of sweetpotato and cassava is also a family and hired labor activity, but not in taro and yam bean where only men and women are involved. However, crop maintenance of the crops is exclusively done by the men. But, among *Kankana-eyes* in Benguet, potato production activities are done by both men and women.

Conclusions

There is a diversity of root and tuber crops grown and cultivated in various landscapes, depending on the production system of the indigenous peoples. This study documented the gender division of labor based on the types of root and tuber crops grown, types of landscape, ethnolinguistic classification, and degree of market orientation.

With regards to gender division of labor in RTC production, men dominated the activities that require physical strength such as land preparation (slashing, cutting and burning of shrubs and clearing, digging or plowing, harrowing, leveling); spraying chemicals, and hauling of inputs and harvested crops. Women are involved in almost all other field activities such as planting, weeding, and harvesting of root and tuber crops. Moreover, women's labor participation with men in land preparation (clearing the land) is higher in swidden farming, rainfed sloping fields, and dry land, which are unfavorable environments. Women of *Masadiit-Tingguians*, *Iyattukas*, and *Applai-Kankana-eyes* dominate all of the activities in yam, sweetpotato, cassava, taro, tannia, lesser yam, and other minor rootcrops because men usually work in the rice field. Thus, RTCs are referred to as secondary crops or regarded as woman's crop because it complements the major crops like rice and other cash crops that are mainly market-oriented.

In subsistence and small farms, women participate more in field activities relative to commercial farms. Also, in indigenous groups, women are traditionally more exposed to physical labor than women in irrigated areas wherein the farming households are better off. In the commercial production of root and tuber crops, men among the *Kapampangans* and *Ilocanos* dominate in crop maintenance, but not among *Kankana-eyes* because both men and women almost equally execute potato production activities.

The active labor participation of women in RTC production among indigenous groups in Northern Luzon, in general, indicates that policy and development workers can capitalize on them in matters related to RTC production as a strategy for food security. Government and private



organizations can work with indigenous peoples working in unfavorable environments, in creating, enhancing, and sustaining semi-subsistence RTC value chains to achieve the goal of food security and sustainable development.

Recommendations

In support of women in RTC agriculture, there is a need to look into the decreasing production, consumption, and number of farmers engaged in root and tuber crop production, as farmers shift to market-oriented farming. The study also recommends that self-sustaining growth of RTCs in the different landscapes be emphasized in conservation efforts, which could be enhanced through training and utilization. Promotion or dissemination of modern and good agricultural practices on RTCs to improve production output and encourage more women, especially the *Aetas* and *Buhid-Mangyans* should be supported by the LGUs or from the agriculture, R&E sectors for sustainable development. Another recommendation is to strengthen the role of women in commercial root and tuber crop production, and increase women access to resources and extension services to enhance the role of root and tuber crops in food security. Finally, the study recommends continuous documentation of the role of women in crop production and management, and identification and analysis of the drivers for culture-specific gender roles that bring about the differences in the division of roles between men and women.

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