ISSN: 2651-6551

INFORMING POLICY AND PRACTICE

Policy Brief Series No. 2023-7

LOSS OF INDIGENOUS KNOWLEDGE ON ROOT AND TUBER CROPS CONTRIBUTES TO FOOD INSECURITY

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HIGHLIGHTS

- **The promotion of high-yielding root and tuber crop varieties led to the disappearance of many indigenous varieties. The clearing of tropical rainforests and abandonment of traditional swidden farms where these crops are grown also contributed to this loss.**
- **The government cash subsidy program to the poorest of the poor brought about the abandonment of root crop food gathering.**
- **With the global problems brought about by climate change, environmental degradation, food insecurity and malnutrition, the potential of these indigenous root and tuber crops (sweetpotato, yams, taro, cassava, and other minor root crops) is worth exploring.**
- **The role of women may be strengthened in root crop farming (commercial or subsistence production) by increasing women's participation and increasing their access to resources and extension services.**
- **Good agricultural practices on root and tuber crop production may be promoted and disseminated to enhance output and encourage more women to participate. This effort may be supported by local government units and the R&E sector.**
- **Strengthening the self-sustaining production of root and tuber crops need to be emphasized in conservation efforts and enhanced through training and utilization.**
- **Enhancing indigenous knowledge and external knowledge in the area of nutrition and the health value of roots and tubers is critical.**

INTRODUCTION

Genetic erosion is among the issues confronting technology development nowadays. In the past decades, emphasis on the promotion of high-yielding varieties of root and tuber crops led to the disappearance of many indigenous varieties and the onset of problems related to environment and culture (Prain and Bagalanon 1998).

Farmers have become mere recipients of varieties, and there is a loss of traditional knowledge on the diversity of roots and tubers among the younger generation (Gayao, Meldoz & Backian, 2017). With the global problems brought about by climate change (environmental degradation, food insecurity, malnutrition), the potential of indigenous root and tuber crops such as sweetpotato, yam, taro, cassava, and other minor root crops is worth exploring. They can be used as substitute staple in place of rice, turned into specialty flour or functional foods or used as a source of medicine.

The clearing of tropical rainforests and the abandonment of traditional swidden farms where these root and tuber crops are grown also contributed to their disappearance. There are no resources to explore and process if these indigenous root crops are lost and remain unknown.

This paper looks at the extent of retention or loss of traditional root crop knowledge and its implication on food security.

METHODOLOGY

Qualitative information was gathered from 184 key informants from 11 provinces in Luzon or 13 selected indigenous people groups (*Ibalois, Bagos, Aetas, Ivatans, Isnegs, Buhid-Mangyans, Biga-Kalingas, Bugkalots, Kalanguyas, Masadiit-Tingguians, Iyattukas, Kankana-eys, Applai-Kankana-eys*) and the two major ethnic groups of *Kapampangans and Ilocanos*. Data were gathered using focus group discussion, field visits and direct observation. Fieldwork was done from February 2012 to October 2013, and follow-up inquiries and integration write-up extended beyond 2017. The traditional root and tubers knowledge (TRK) test were used to determine transfer or loss.

Series of focus group discussion with the 13 selected indigenous people groups (*Ibalois, Bagos, Ivatans, Isnegs, Buhid-Mangyans, Biga-Kalingas, Bugkalots, Kalanguyas, Masadiit-Tingguians, Iyattukas, Kankana-eys, Applai-Kankana-eys*) and the two major ethnic groups of *Kapampangans* and *Ilocanos*.

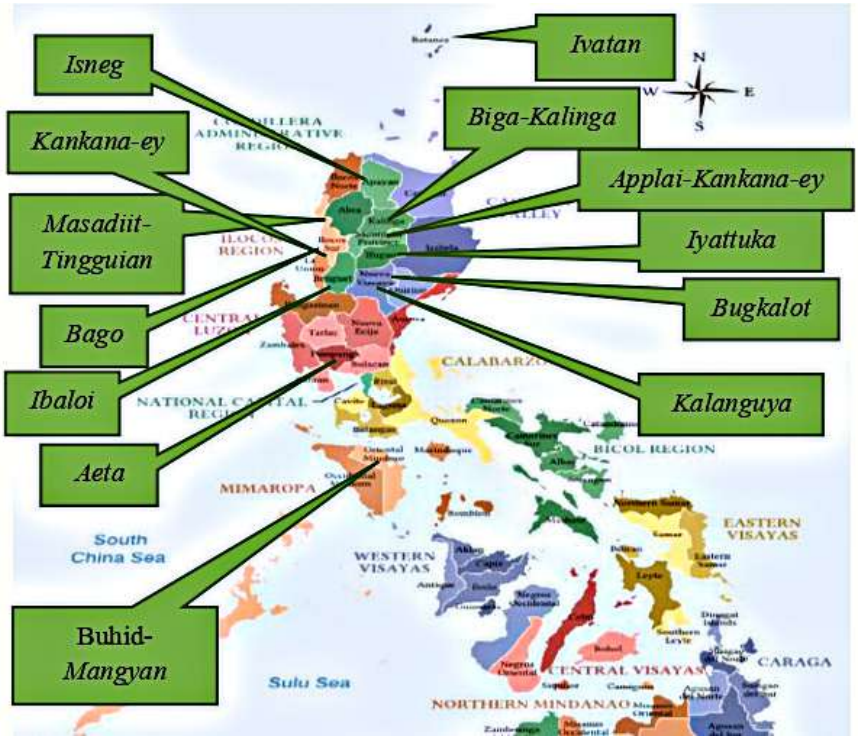

Fig 1. The location of the IP respondents in Northern Philippines

FINDINGS

DIVERSITY OF ROOTS AND TUBERS KNOWN BY INDIGENOUS PEOPLES

Indigenous peoples (IPs) in the northern Philippines have identified 20 roots and tubers consisting of ten cultivated species and probably more than ten species of wild roots and tubers. The roots and tubers planted are cassava, sweetpotato, greater yam, taro, tannia, lesser yam, arrowroot, potato, yacon, and yam bean. Wild roots and tubers include nami, elephant yam, giant taro, canna, wild yam bean, and wild species of taro (3), greater yam (3), and lesser yam (1). This diversity of roots and tubers once grown or harvested by the IPs is a reflection of their food security situation and an indicator of the crops' adaptation to climate change.

HABITAT, USE, AND EXTENT OF PRODUCTION

Most of the IPs do not only plant roots and tubers for household food and feed security but also for trade, especially sweetpotato, cassava, greater yam, taro, tannia, and potato. However, the planting of yacon and arrowroot and the gathering of wild roots and tubers among IP households decreased due to lack of market and availability of other sources of income, food, and feeds.

The diversity of roots and tubers and their ability to grow in different habitats (swidden farms, rainfed and irrigated paddies, home gardens, forests, pathways, and waterways) indicate the crops' adaptation that must be looked into in climate change mitigation efforts.

RETENTION OR LOSS OF TRADITIONAL ROOT CROP KNOWLEDGE

There was a loss of traditional root crop knowledge (TRK) among the younger age group (15-35 years) and the middle age group (36-56 years), especially among the *Tingguians and Iyatukkas,* the male *Ibalois* concerning knowledge of roots and tubers planted (TPK), and both male and female *Ibalois* and *Bagos* for knowledge of wild roots and tubers as shown by the intergenerational rate of retention and cumulative retention rate (Table 1). The younger *Tingguians* retained only 40-83% of the middle age group's knowledge of planted and wild roots and tubers and the *Iyattukas* retained 80-95%.

Between the middle age group and the oldest age group (57-77 years), there was less loss of knowledge on root crops planted and known (RPK) among the male *Bago, Tingguian, and Iyattuka* IPs at retention rate ranging from 76 to 90%. The Ibalois and *Iyattukas* and the *Bagos* and *Tingguians* who claim to operate large areas before the 1980s for sweetpotato swidden or upland rice, respectively, have now diminished areas—as low as 2-750 hills of any root crop planted in a 600-1,000 m2 swidden farm (Gayao, et al., 2013, 2014). The intensive use of spaces near or along the rice terraces of the *Iyattukas* also decreased, brought about by the preference of the younger generation for off-farm employment, which, in turn, reduced the dependence on roots and tubers for food security.

The Bago village leaders claimed that the government cash subsidy to the poorest of the poor brought about the abandonment of root crop food gathering.

The reduction in root and tuber production did not always result in a loss of knowledge. Between the younger-aged and middle-aged *Bagos* and female *Ibalois*, there was retention or an increase in the knowledge of roots and tubers planted (Table 1). Between the middle age group and the oldest age group, the female *Ibalois, Bagos,* and *Tingguians* had gained knowledge on roots and tubers planted (104-149% RGt; 102-119% RCt), and the female *Iyattukas* got more knowledge on wild roots and tubers (104-109%). This result was attributed to the fact that it was the women who are at home taking care of young children, overseeing the farm and forest lands, and being in charge of day to day household food, such that they become more knowledgeable on collecting, planting, harvesting, cooking, and preserving the different kinds of roots and tubers. Until now, a small volume of roots and tubers is exchanged or sold by stay-home women and the elderly for kitchen necessities and cash needs.

The younger male *Bagos* and the middle-aged male *Ibalois* had higher retention rates (117 and 122%, respectively) on roots and tubers planted than the females (108 and 88%, respectively). This result could be attributed to the increasing cultivation of greater yam, taro, and cassava as cash crops.

Table 1: Intergenerational rate of retention (RGt) between successive pairs of age groups and the cumulative rate of retention (RCt) retained by each succeding age group among selected IPs in the northern Philippines.

Age Group (years)	IP Group	Intergenerational rate of retention				Cumulative rate of retention			
		Root Crops Planted and Known (RPK)		Wild Root Crops Known (WRK)		Root Crops Planted and Known (RPK)		Wild Root Crops Known (WRK)	
		Male	Female	Male	Female	Male	Female	Male	Female
15-35	Ibaloi	0.75	1.04	0.94	0.29	0.90	1.02	1	0.58
	Bago	1.17	1.08	0.68	0.41	1.10	1.03	0.80	0.68
	Tingguian	0.40	0.50	0.14	0.66	0.70	0.74	0.40	0.83
	Iyattuka	0.89	0.89	0.67	0.69	0.90	0.95	0.80	0.85
36-56	Ibaloi	1.22	0.88	0.43	0.80	1.10	0.95	0.70	0.91
	Bago	0.78	1.49	1.04	1.39	0.90	1.19	1	1.16
	Tingguian	0.84	1.29	1.02	0.78	0.90	1.12	1	0.90
	Iyattuka	0.76	0.85	0.90	1.09	0.90	0.93	1	1.04
57-77		1	1	1	1	1	1	1	1

■ -Loss/ decrease in TRK ■ -Transfer / increase in TRK

LOSS OF INDIGENOUS KNOWLEDGE ON ROOT AND TUBER CROPS CONTRIBUTES TO FOOD INSECURITY

CALL TO ACTION

- ✓ Enhance the role of root crops in food security by strengthening the role of women by increasing women's participation in root crop farming (commercial or subsistence production) and increasing their access to resources and extension services.
- ✓ Promote or disseminate modern and good agricultural practices on root and tuber crop production to enhance output and encourage more women to engage in it.
- ✓ Self-sustaining production of root and tuber crops may be emphasized in conservation efforts, which could be enhanced through training and utilization.
- ✓ Continue the promotion and transfer of both new and traditional knowledge on the habitat, production, and utilization of root and tuber resources to ensure the conservation, sustained production, and increased consumption of these crops, which, may reduce rice importation in the long run.
- ✓ Raise awareness of the value of indigenous knowledge, as well as, enhance knowledge in the area of nutrition and health value of roots and tubers.

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ABOUT THE MATERIAL

Informing Policy and Practice is published quarterly by the Institute of Social Research and Development and R & E Publications Office of Benguet State University. It synthesizes findings from research and development activities, or presents results of quick survey and opinion poll on social, economic, and policy issues and concerns affecting the Cordillera region. It also distills the key messages and provides recommendations for the information and consideration of relevant stakeholders and policymakers.

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Published by the Institute of Social Research and Development, Benguet State University | Distributed by the Research and Extension Publication Office, Benguet State University