



# VEGETABLE SEED SYSTEMS AMONG ETHNIC MINORITY COMMUNITIES IN NORTHERN VIETNAM

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## KEY MESSAGES

- 1 Inadequate access to quality seed is a major constraint affecting vegetable production, vegetable diversity and diet quality.
- 2 A wide variety of vegetables are grown at district level, but with limited variation at individual household level.
- 3 The diversity and seasonality of Dark Green Leafy Vegetables, Other vitamin A rich vegetables, and Other vegetables at district level can be harnessed to ensure year-round vegetable access at household level.
- 4 Both self-saved seed and bought seed are important sources for farmers and are linked to the primary purpose of production, market access, seed production knowledge and skills, and trustworthiness of the source.
- 5 Purchased seed includes seed from both the formal system (packaged seed) and informal system (unpackaged seed).
- 6 Vegetable diversity, seasonal availability and seed access varies with ethnic group, location, type of and specific vegetables requiring contextualisation of nutrition-sensitive interventions.
- 7 Main barriers to seed access in both the informal and formal seed systems included inadequate seed availability, inadequate post-harvest handling practices, uncertain or insufficient seed quality, high cost of seeds and long distances to markets.
- 8 There are opportunities for farmer sharing and exchange of seeds, vegetables, and knowledge, for safeguarding diversity, promoting dietary quality, and improving farmer income.

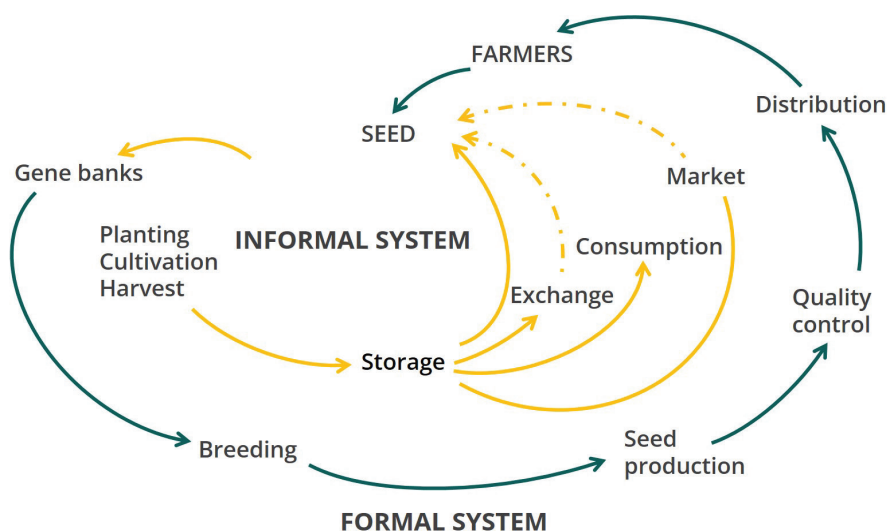
# SEED SYSTEMS FOR NUTRITION AND INCOME

Vegetables in the Northern highlands are important for both nutrition and income. With more than 750,000 farmers of diverse vegetables in 2017 <sup>1</sup>, this number continues to grow. Vegetables in this region are an important source of off-season vegetables for lowland areas and big cities like Hanoi. The cool climate all year round supports many temperate vegetables, making them a good income source. For areas with poor market access, however, vegetable production is mainly linked to home-consumption. Hence vegetable production can be vital to household access to quality diets, a factor of particular importance among vulnerable ethnic minority communities.

Despite the potential, vegetable production suffers from limited access to resources such as seed, inputs, infrastructure, knowledge, and value chain linkages. Inadequate access to quality seed of local and introduced vegetable varieties is a major

constraint that not only affects vegetable production but also vegetable diversity and diet quality. Therefore, understanding how and under what conditions access to and use of high-quality seed can be increased is of significant value.

As part of a vegetable seed systems project funded by the Dutch Research Council (NWO) under the Netherlands – CGIAR research programme, a seed system characterization was conducted among H'mong, Thai and Dao ethnic groups in 32 villages in Loa Cai Province (Sa Pa Township) and Son La Province (Mai Son District) to establish the current practices and identify key leverage points for upgrading vegetable seed systems to improve income and nutrition (Fig 1, Box 1). By focusing on the production and diversity of vegetables, as well as seasonality aspects, we will show how seeds can play an important role in improving nutrition.



**Fig 1.** Formal and informal seed systems. (Modified from Almekinders and De Boef, 2000) <sup>2</sup>.

Through surveys, interviews, and discussions participants across the two systems involved in the seed system characterization, included farmers, cooperatives, seed vendors, Department of Agriculture and Rural Development, health and agricultural extension.

## Box 1: Food categories used in the seed system characterisation

**Dark Green Leafy Vegetables (DGLV):** medium-to-dark green leafy vegetables that are rich in vitamin A and iron.

**Other vitamin A rich vegetables:** vitamin A-rich vegetables other than dark leafy greens.

**Other vegetables:** vegetables that have not been counted as DGLV or as other vitamin A-rich vegetables or condiment vegetables. Varying nutritional content, important for nutrients such as vitamin A, C, K and E, potassium, magnesium, zinc, phosphorous, folic acid, antioxidants, and dietary fibre.

**Condiment vegetables:** diverse vegetables usually consumed in quantities too small to count towards dietary quality. Usually used to enhance dishes.

**Pulses:** pulse/ legume seeds consumed when mature are rich in protein, iron, folate and zinc. Immature pods are commonly consumed as vegetables in target sites and in this state are categorised under 'other vegetables'

(Modified from the Minimum dietary diversity for women, FAO, 2021) <sup>3</sup>

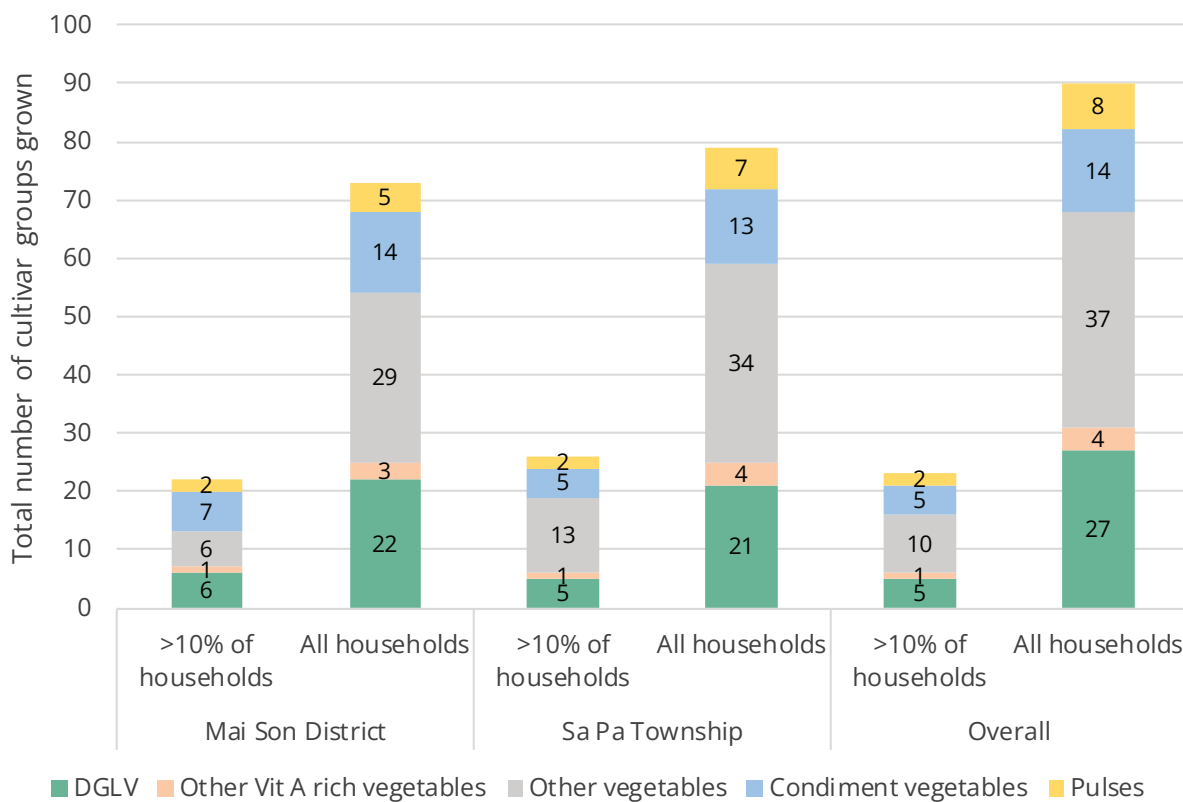
# VEGETABLE PRODUCTION AND DIVERSITY

On average, households grew 7 different vegetables per year. The number varied with ethnic group and vegetable category and depended on land availability, agro-ecological conditions, culture, relative importance versus other crops, availability of labour and time, production experience and knowledge and seed access, which may explain differences between sites and ethnic groups.

The primary purpose of vegetable production in Mai Son District and Sa Pa Township was consumption (>90%), with surplus being sold for most vegetable categories. In Mai Son, vegetables that had the highest reports of being grown primarily for sale were mainly DGLVs and vitamin A rich vegetable categories (13% and 27% respectively), and in Sa Pa were DGLVs and other vegetable categories (22% and 19% respectively). There were differences with ethnic group, food categories and specific vegetables which were mainly related to proximity to local markets. For example, households of the H'mong ethnic group living in Sa Pa Town produced more often for markets, but this is often related to specific

vegetables. Examples of specific vegetables that were primarily grown for sale by >20% of households included, Chinese flowering cabbage, Chinese kale/Gailan, leaf mustard, Broccoli, kohlrabi, napa cabbage, and radish.

Although the number of vegetables produced per household on average was limited, a look at vegetable production among the ethnic communities in the two districts showed large diversity. While 90 different cultivar groups<sup>a</sup> were reported (27 DGLV, 4 other vitamin A rich vegetables, 37 other vegetables, 14 condiment vegetables, and 8 pulses), only a quarter (23) were produced by more than 10% of households (5 DGLV, 1 other vitamin A rich vegetable, 10 other vegetables, 5 condiment vegetables, and 2 pulses) (Fig 2). This trend was similar across the different ethnic groups. This indicates large variations between individual households, providing an opportunity for promotion of diversity especially nutrient dense vegetables, as well as sharing and exchange of seed and vegetables.



**Fig 2.** Number of vegetables per category grown by all surveyed households versus those grown by >10% of households per district

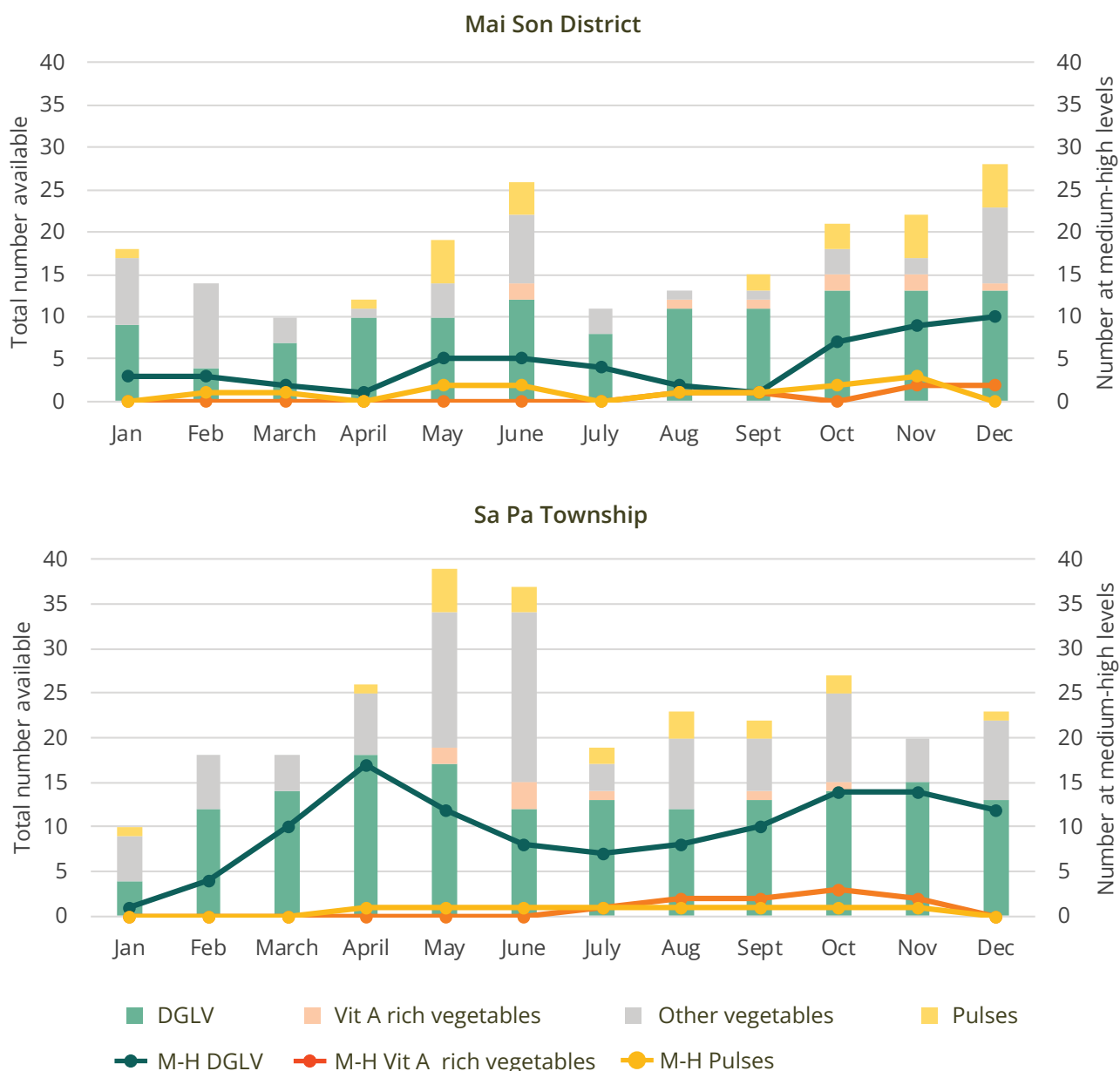
<sup>a</sup> A collection of cultivars that have a set of common characteristics from a consumer perspective. Cauliflower thus is a group with below it several cultivars, broccoli is another group within the same species but here considered distinct from cauliflower.

# SEASONAL AVAILABILITY

Vegetable availability is highly seasonal, given their perishability and short shelf-life. It is therefore important to know when vegetables are available for consumption and identify ways to overcome the lean periods. Availability of the different food categories varied throughout the year, both in the total number of different type of vegetables available and the number available for consumption at medium to high levels (Fig. 3, condiments were excluded given their limited nutritional contribution). There were lower levels of availability in Mai Son compared to Sa Pa and despite seasonality varying with ethnic group and food categories, overall, the lean periods in Mai Son were January to April and July to September and

in Sa Pa from January to March and June to August.

The existing diversity can be harnessed to improve access all-year round. This could be achieved through improving production practices, cultivation area, number of seasons or diversity grown (especially species available in the lean periods); utilising food preservation methods; promoting sharing and/or exchange of vegetables and seeds; and improving seed handling practices such that seed is readily available in each season. Indeed, improved access to high-quality seeds of suitable vegetable varieties for different seasons can make an important contribution to year-round availability.

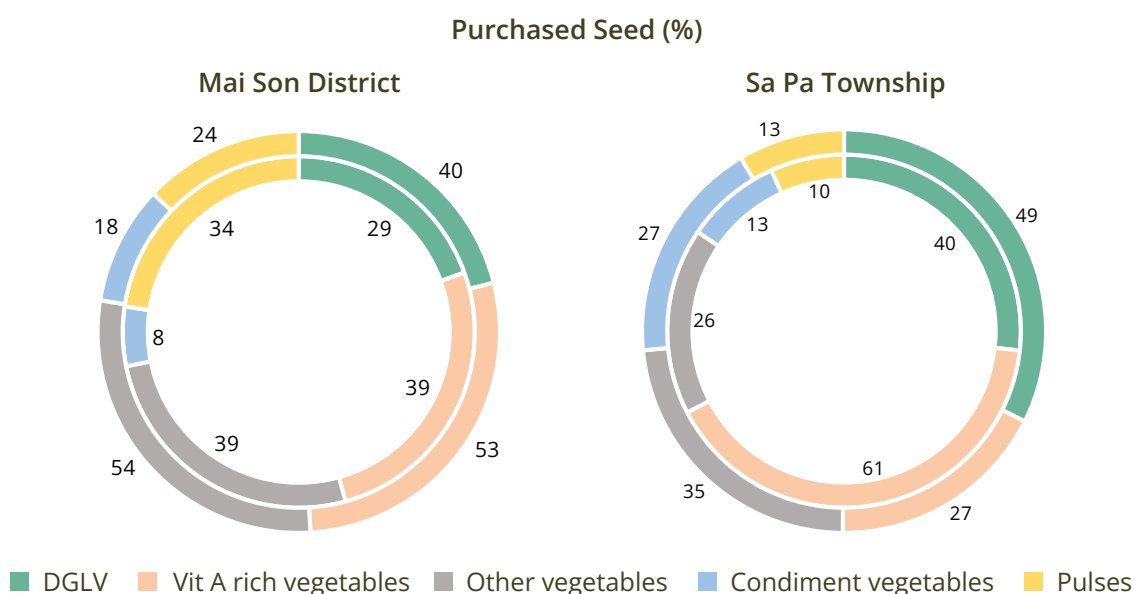


**Fig 3.** Availability of vegetable per category throughout the year (bars) and the number available for consumption at medium to high levels (lines) in Mai Son District (top) and Sa Pa Township (bottom)

# SEED SOURCING AND BARRIERS

The seed used by farmers was mainly self-saved from their own stock (34-91%), although a substantial part was purchased (8-61%) (Fig 4). In addition, some seed was obtained through gifts, exchange or other support like from government (<12% of households). Seed access varied with ethnic group, district, communes, and specific vegetables. For example, almost an equal proportion of households used self-saved and purchased seed in Sa Pa for DGLVs (51 vs 46%) and vitamin A rich vegetables (52 vs 48%) and

in Mai Son for the other vegetables (54 vs 42%). Condiments in Mai Son (Thai) and Sa Pa (Dao) and pulses in Sa Pa (H'mong and Dao) were the least purchased seeds across all districts. Examples of vegetables for which >90% of farmers bought seed in Mai Son included carrot, broccoli, cabbage, Napa cabbage, cauliflower, and Kohlrabi, and in Sa Pa included Ceylon spinach, sweet potato leaves, Brussel sprouts, Romaine lettuce, and Dill.



**Fig 4.** Percentage of households that purchased seed per category in Mai Son District for the Thai (inner ring) and H'mong (outer ring) and Sa Pa Township for the Dao (inner ring) and H'mong (outer ring)

Purchase of seeds was more common among farmers growing vegetables for commercial purposes and was mainly sourced from the district market in Sa Pa and the commune market in Mai Son. Less than 10% of farmers accessed seed from other community members (family, neighbours). The issue of trust was important whereby self-saved seed and seed from friends or relatives in both districts, as well as seed from the commune market in Mai Son and district market and agro-input dealers in Sa Pa were considered the most trustworthy sources. However, the commune and district market for both districts were also among the least trustworthy seed sources as well as traders. This lends to the varied farmer experiences that were attributed to farmer knowledge on varieties and seed quality, seed price, levels of market access where those closer to markets were likely to have better rapport with the vendors, and the quality and type of seed bought. The type of seed is of particular importance because bought seed includes seed from both the formal system which is packaged,

commercially produced and marketed, and seed from the informal system, that is unpackaged, saved by other farmers and made available in the market. Both types of seed were reported to have varying information and quality.

Barriers to seed access were similar across ethnic groups and districts. 1) Barriers faced in both the informal and formal seed system included inadequate seed availability of preferred vegetables/varieties. 2) In the informal seed system challenges were related to post-harvest handling, knowledge and skills, and seed quality, as poor drying and storage practices, pest attacks, and moulding of seed exacerbated seed loss with reports of losses up to 20%. There was also lack of reliable information on different vegetables/varieties and how farmers could identify high quality seed and reliable seed sources. 3) For the formal seed system, barriers included inadequate seed access due to high cost of seeds and long distances to markets, and uncertain or inconsistent seed quality.



## BEST WAY FORWARD

Based on the characteristics of vegetable seed access among the H'mong, Thai and Dao ethnic minority groups in Mai Son District (Son La Province) and Sa Pa Township (Lao Cai Province), opportunities for improving access to quality seed were identified as:

- 1** Improving the seed quality of local vegetables through enhanced production, selection, and storage techniques with farmers. This includes participatory evaluation of recommended and commonly used practices to identify and promote feasible and effective labour and cost-effective seed production, processing, and storage practices.
- 2** Enhancing farmer seed networks that enable exchange of seeds and production skills, coupled with nutrition education. Nutrition education would promote vegetable categories that can make significant contributions to nutrition and health such as DGLVs and other vitamin A rich vegetables.
- 3** Development of value chain arrangements using the Farmer Business School approach to equip farmer groups commercially producing seed and vegetables and increase farmer income from seed and vegetable production.
- 4** Development of nutrition sensitive value chains for seeds with market potential for income generation among smallholder farmers and other value chains actors. Thus, increasing farmer income, and availability of seeds and products of nutrient dense vegetables (especially if the produced seeds are utilised within the communities).
- 5** Supporting value chain actors and monitoring bodies to improve, ensure and promote seed quality, both commercially produced seed and seed from the informal system that enters the market.
- 6** Community or regional level conservation and multiplication of local and nutritious varieties for example through seed banks. This has the potential to increase accessibility and availability of diverse seed especially indigenous or local seeds.

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