

# Integrated Needs Assessment of Rootcrops Production-Utilization Systems in Vietnam<sup>1</sup>

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## Abstract

As a collaborative effort of seven Vietnamese institutions, the International Potato Center and UPWARD, a participatory needs assessment on rootcrops production-utilization systems is being conducted covering 32 villages in 8 major rootcrop production provinces of Vietnam. Needs assessment methodology consists of four phases: (1) study design and preparation, (2) training of study teams and pretesting of data collection methods, (2) data collection, and (4) data analysis and follow-up planning. Data collection took place during the 1998/99 winter-spring season. A national workshop is planned for August 1999 during which needs assessment results will be analyzed with all stakeholders and, based on these results, collaborative research and development programs on rootcrop production and utilization will be planned. Since farmers are intensively involved in the data collection process, the study is expected to reveal potential options for improved rootcrop production-utilization systems, and facilitate active farmer involvement in technology and training development activities later.

## Introduction

Vietnam has a large variety of rootcrops. The main types of rootcrops cultivated are sweetpotato, cassava, canna, and taro. Utilization of these rootcrops includes the consumption of fresh storage roots as a starch source for humans, the use of roots and vines as feed for animals, and as raw material for the processing and medical industry. Rootcrops contribute significantly to the food security in Vietnam. In 1995, the area covered by rootcrops was estimated at 650,000 ha with a total production of around 4.7 million tons (Source: Statistical Yearbook, 1997). Among all rootcrops, sweetpotato occupies the largest area (Table 1). Sweetpotato is considered a crop of low economic value, as it grows in relatively infertile soils and under unstable climatic conditions, such as those often found in Central Vietnam. With intensive cultivation under favorable conditions, however, sweetpotato can provide a very good profit to farmers. In recent years, with the support from several international agricultural research centers, including the International Potato Center (CIP), the International Center for Tropical Agriculture (CIAT), and International Development Research Center of Canada (IDRC), research and

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development of rootcrops has been strengthened. Pilot activities showed that the net income of rootcrop farmers can be augmented with improved technology.

**Table 1: Area, productivity and production of major rootcrops in Vietnam, 1995, 1996 and 1997 (Source: Statistical Year Book, 1997)**

Year	Sweetpotato			Cassava		
	Area (ha)	Productivity (t/ha)	Production (t)	Area (ha)	Productivity (t/ha)	Production (t)
1995	304,600	5.53	1,685,800	277,400	7.97	2,211,500
1996	302,700	5.61	1,697,000	275,600	7.50	2,067,300
1997	267,400	6.14	1,642,500	238,700	8.31	1,983,000

Various Vietnamese research and development institutions have collaborated with the International Potato Center (CIP) and UPWARD over the past decade on rootcrop production and post-production improvement. In a consultation meeting between CIP scientists and NARS partners held in January 1998, the lack of comprehensive, reliable and updated information on rootcrops in Vietnam was identified as a key issue. A needs assessment exercise was therefore recommended as a key step towards undertaking action-oriented type of research. Assessment studies had been conducted before, although only for selected rootcrops and focusing on specific disciplines and specific locations. An integrated assessment on the status, needs and opportunities of production and utilization systems for selected rootcrops in key provinces of Vietnam, however, was considered to provide valuable input for production and post-harvest activity development of both national institutes and CIP/UPWARD projects. A collaborative study was designed and prepared during the second half of 1998, and launched in December 1998. This paper presents the methodology and implementation mechanisms of this study, and gives some tentative issues and conclusions that arose from data collection activities until the time this paper was written.

### Needs assessment methodology

The overall objective of the study was to undertake a benchmark assessment of rootcrop production and utilization systems in key production areas in Vietnam as to identify opportunities and mechanisms for improvement of rootcrop enterprises. The specific objectives were:

- To document and analyze rootcrop production-utilization systems in selected provinces of Vietnam, with emphasis on sweetpotato.
- To determine rootcrop farmers' variety requirements, cultivation and post-harvest problems and practices, and needs and opportunities for improvement.
- To identify and prioritize relevant research and development interventions and mechanisms for rootcrop technology development, promotion and institutionalization.

In general, the assessment study emphasized two key types of benchmark information in key locations across the country, i.e. (1) sweetpotato and canna production/crop management, and (2) sweetpotato,

canna and cassava utilization (potentials). Table 2 presents the focus of the assessment in terms of regions/provinces, types of rootcrops, and components of the rootcrop systems studied. Table 3 shows some sweetpotato and cassava production indicators for the eight study provinces. In each province two districts, and per district, one commune and two villages within this commune, were selected based on the following criteria:

- Key production and utilization area of the rootcrop(s) under investigation.
- Representative for rootcrop producing villages in the district.
- Have not been subject to intensive previous research or pilot development projects.
- Willingness of the local government and farming community to participate.

**Table 2: Study areas and focus of assessment.**

Region	Province	Sweetpotato		Canna		Cassava	
		Production	Utilization	Production	Utilization	Production	Utilization
North Vietnam	Vinh Phu						
	Ha Bac						
	Hoa Binh						
Central Vietnam	Thanh Hoa						
	Quang Nam						
South Vietnam	Ba Ria/Vung Tau						
	Vinh Long						
	An Giang						

**Table 3: Area, productivity and production of sweetpotato and cassava in the survey provinces, 1997 (Source: Statistical Yearbook, 1997).**

Province	Agroecological region	Sweetpotato			Cassava		
		Area (ha)	Productivity (t/ha)	Production (t)	Area (ha)	Productivity (t/ha)	Production (t)
Vinh Phu	Northeast	7,300	5.00	36,500	2,100	6.00	12,600
Ha Bac	Northeast	15,800	7.16	113,100	5,400	8.33	45,000
Hoa Binh	Northwest	4,700	3.89	18,300	8,600	6.55	56,300
Thanh Hoa	North Central Coast	27,700	5.27	146,100	14,400	6.18	89,000
Quang Nam	South Central Coast	11,500	5.37	61,800	12,400	9.62	119,300
Ba Ria/Vung Tau	Northeast South	1,000	5.60	5,600	7,700	11.21	86,300
Vinh Long	Mekong River Delta	2,100	24.14	50,700	300	12.33	3,700
An Giang	Mekong River Delta	800	12.00	1,200	1,100	13.55	14,900

The village was the major unit of study. The study covered a total of thirty-two villages in sixteen communes in sixteen districts in the eight selected provinces. In each province, the study was conducted by a team consisting of one or two Vietnamese scientists and one field assistant selected by the scientists, who were students and recent graduates in the fields of agricultural socio-economics or a relevant biological sciences.

The needs assessment design contained four phases:

1. *Preparation*: Identification of potential partners (CIP projects and NARS institutions), review of secondary data, formation of research teams, and initial development of assessment framework and methodology (July – November '98).
2. *Assessment team training workshop*: Training on participatory assessment methods for assessment team members, translation, pretesting and revision of methodology (late November '98).
3. *Field work*: Data collection and field documentation by assessment teams in respective areas of assignments. Data collection will initially cover the December '98 - April '99. The option of a possible second season of data collection (April - August, 1999) will be decided upon analysis of the first season data.
4. *Data processing, analysis and documentation*: computerization of data, analysis meetings at community level, qualitative and quantitative analysis, report writing, seminar preparation (March - June '99);
5. *Summative national workshop*: seminar on study results to representatives of stakeholder groups, consolidation, R&D priority setting, developing action plans for follow-up research and development (September '99).

During the data collection phase the following methods were applied:

1. *Analysis of secondary data*: A list of documents containing useful secondary data to provide information about the overall context of the needs assessment was prepared during the preparation workshop. The documents were collected in the CIP Hanoi office for further reference by the team members.
2. *Village profiling*: Participatory Rural Appraisal (PRA) methods were used to obtain an overall picture of the agroecological and socioeconomic conditions of the villages, and to trigger the interest and participation of the communities. Methods included transect walk, participatory mapping, group discussion(s) with farmers (men and/or women) using matrix ranking exercises and seasonal calendars, and informal discussion with farmers, traders, retailers, processors and consumers.
3. *Season-long cultivation record keeping*: a representative sample of sweetpotato and canna farmers in each village were provided with a calendar form for daily record keeping of production practices, inputs and outputs. The farmers were assisted by the field assistants.
4. *Sweetpotato field observation*: Sweetpotato fields of the farmers keeping cultivation records were monitored by the field assistants for pest and natural enemy incidence, crop health and environmental conditions as a cross-check for the production analysis.
5. *Individual production interviews*: The sweetpotato and canna farmers keeping season-long records were interviewed using a structured questionnaire twice during the season on qualitative aspects of sweetpotato/canna production, and their cultivation practices during the previous major season.

6. *Individual utilization interviews*: A representative sample of sweetpotato, canna and cassava processors was interviewed using structured questionnaires on rootcrop utilization aspects, i.e. pigfeed and starch production.
7. *End-of-season analysis meeting*: Tentative results were presented back to the participating farmers (men and women) and processing families for initial analysis and priority setting.

## Implementation mechanisms

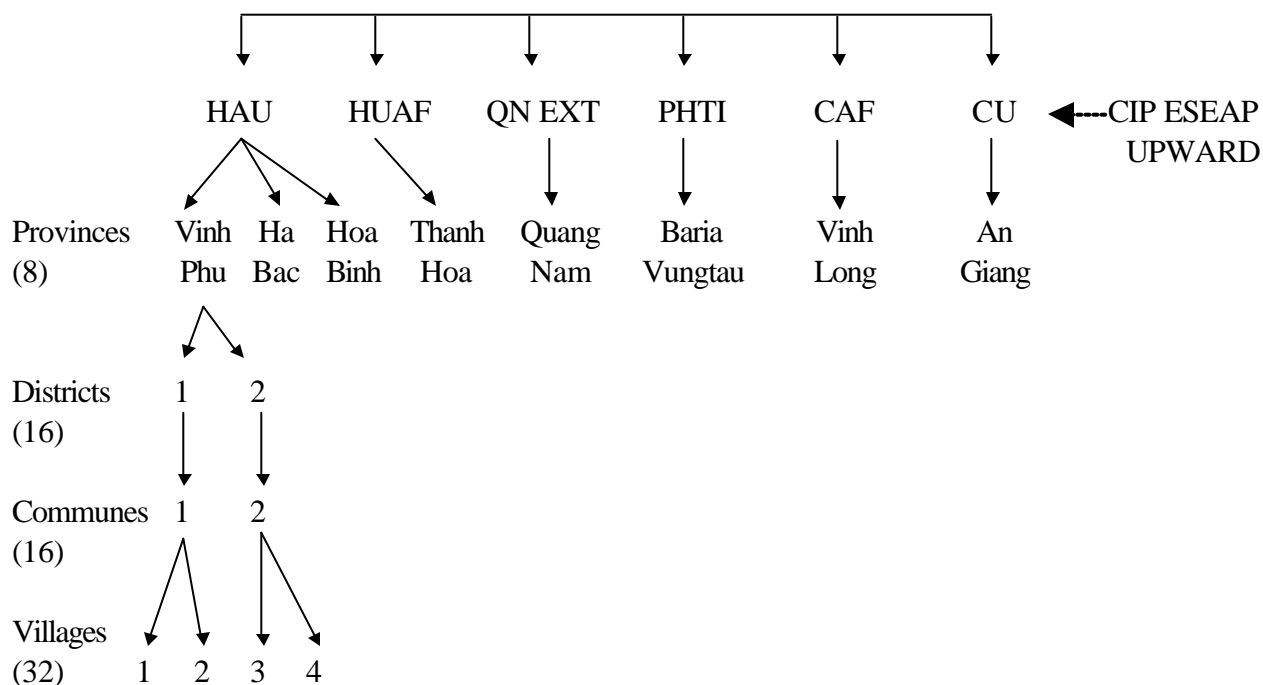
The needs assessment implementation team consisted of eight scientists with diverse disciplinary backgrounds and from different institutions (Table 4). Each scientists worked in a team with a field assistant in four villages in one province (see Figure 1). The integrated nature of the study, including crop management, post-harvest and farm economics aspects, required that the team members shared experience and disciplinary information during the preparation workshop. Data collection guidelines had been drafted by CIP scientists, but were reviewed, pretested in the field, and revised by the Vietnamese team members during the preparation and training workshop, after which they were translated into Vietnamese.

**Table 4: Composition of the study team.**

Study site (province)	Discipline of scientist in charge	Institutional affiliation
Vinh Phu	Entomologist	Dept. of Entomology, Hanoi Agriculture University
Ha Bac	Agricultural economist	Dept. of Economics and Rural Development, Hanoi Agriculture University
Hoa Binh	Agricultural economist	Dept. of Economics and Rural Development, Hanoi Agriculture University
Thanh Hoa	Entomologist	Dept. of Crop Protection, Hue University of Agriculture and Forestry
Quang Nam	Extensionist/agronomist	Thang Binh District Agriculture and Rural Development Bureau, Quang Nam Province
Ba Ria/Vung Tau	Entomologist	Post-Harvest Technology Institute, Ho Chi Minh City
Vinh Long	Agronomist	Dept. of Agronomy, College of Agriculture and Forestry, Ho Chi Minh City
An Giang	Rural development specialist and agronomist	Department of Crop Science, College of Agriculture, Cantho University

At each study site, a field assistant was assigned. The field assistants participated in the preparation and training workshop. Throughout the data collection season, they resided in the field rotating between the four villages in their designated area. The scientists paid regular visits to the study sites to supervise the field assistants and assist data collection.

Monitoring sheets were distributed to the team members in each province for monthly reporting to CIP/UPWARD. This brief reporting of field activities served to keep track of what was going on in the field, report on problems encountered in the field, and propose activities planned for the coming month. In practice, this monitoring system did not work as well as expected, due to late or no response from the team members making it difficult to give useful feedback. At least one monitoring visit per study site was paid by one of CIP's scientists involved in the needs assessment.



**Figure 1: Implementation mechanism for integrated rootcrops needs assessment in Vietnam.**

The roles of the various partners involved in the study are summarized below:

1. National scientists:
  - Participate in preparatory training workshop.
  - Translate needs assessment guidelines.
  - Select respondents in collaboration with province, district and commune officials.
  - Conduct village meetings on the objectives and methods of the assessment at the beginning and discussion about constraints and opportunities for improvement of rootcrops production and utilization systems.
  - Conduct village profiling exercise using PRA methods.
  - Supervise and assist the field assistant.
  - Write monthly monitoring report.
  - Enter and process data.
  - Write final report.
2. Field assistants:
  - Participate in preparatory training workshop.
  - Help select study sites.
  - Conduct village profiling exercise using PRA methods.
  - Make a map on crop distribution in each study village.
  - Conduct interviews with farmers on production and utilization

- aspects.
- Guide farmers to keep cultivation records.
  - Observe fields of record keeping farmers routinely for pest, disease and natural enemy occurrence.
3. CIP/UPWARD:
    - Draft methodology and data collection guidelines.
    - Conduct preparation and training workshop for study team.
    - Coordinate participation of national collaborators.
    - Provide funds.
  4. CIP Hanoi Office:
    - Pay monitoring visits to study sites.
    - Coordinate logistics.
  5. National institutions:
    - Provide staff for the study team (scientists and field assistants).
    - Create favorable conditions for staff to participate in study.
  6. Provinces:
    - Help select the study districts.
    - Introduce the assessment team to the agricultural department of the selected districts.
  7. Districts:
    - Help select study communes.
    - Provide secondary data on production and utilization of rootcrops at the district level.
    - Provide information on constraints and opportunities for improvement of rootcrops production and utilization systems.
  8. Communes:
    - Help select households to participate in data collection.
    - Invite farmers for data collection activities.
    - Introduce the assessment team and explain the objectives of the study to the community, and encourage villagers to actively participate.
    - Participate in PRA exercises.
    - Participate in discussion on constraints and opportunities for improvement of rootcrops production and utilization systems.

### **Implementation constraints**

The needs assessment was conducted during the winter-spring season in North and Central Vietnam. In some areas, farmers are usually very busy during this season with many farming activities, such as rice post-harvest activities, and the establishment of maize and vegetable crops. Farmers' time for the needs assessment data collection was, therefore, limited to the few hours around noon or at night. Additionally, seasonality gives a biased picture of the data collected and comparison with other major sweetpotato growing seasons is desirable. This has been anticipated by retrospective interviews about the previous season, although this method is likely to give less reliable data than those conducted throughout the study season.

In some locations, farmers' motivation to participate in the study was not always as high as expected. One reason may be that rootcrops are not a priority crop for farmers since they generally provide a low income, due to either low yields or low market price at surplus production. A second reason is that some of the data collection methods were new for both farmers and study team members causing them to feel unconfident to collect or provide the data. The training on participatory approaches given prior to data collection was too brief for those without experience to gain enough skills for successful implementation of the methodology.

In some of the provinces, the two districts selected for the study were located far from each other. This implied a lot of traveling for the study teams. Especially the field assistants, who had to pay biweekly visits to all four villages in the province did not have much flexibility in their visiting schedule when villages were far from one another.

### **Tentative issues for follow-up research and development**

Although data collection and processing was not finished yet at the time this paper was written, a few tentative issues that arose from the field work are presented here. In general, productivity of rootcrops in Vietnam is low, especially on the less fertile soils in North and Central Vietnam. Low yields were due to stress factors such as low soil fertility, low temperature and short growing season in winter. Biotic stress factors included pests and diseases such as the sweetpotato weevil in the North and South, and stemborer in Central Vietnam. Efforts relating to balanced nutrient management and effective pest management are expected to render considerable impact on productivity levels.

To enhance utilization opportunities, farmers expressed a need for high yielding varieties, relating to both vines and roots. In additions, they wished that varieties possess tolerance to the sweetpotato weevil, drought and cold, and are early maturing. Post-harvest technologies needed that would increase farmers' profit of the rootcrop enterprise include good farm-level storage techniques and practical, small-scale processing machines to extract starch for making noodles and snacks, or for chipping.

### **Conclusion**

This integrated needs assessment is the most comprehensive study ever done in Vietnam on rootcrops production-utilization systems. It contains production, post-production and socioeconomic elements that are expected to provide a fairly complete picture of the constraints and opportunities of rootcrop enterprises in various parts of the country under the current conditions. The needs assessment strategy and implementation mechanisms were well planned in advance in a collaborative manner, so that no problems of importance arose during the data collection phase. The participatory nature of the study allowed to identify needs and possible solutions that are expected to be close to farmers' realities.

The study serves as a foundation for further technology and extension development. The expected output is a research and development agenda tackling farmers' prioritized needs. The interdisciplinary composition of the study team facilitates the integrative approach of the study, and provides a rich resource for later technology development. Farmers active involvement in the needs assessment is expected to result in continued participation of farmers during research and development stages.