



Potato Production, Marketing, and Utilization in Meghalaya, India: Results of a Value Chain Assessment

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India is currently the second largest producer of potato worldwide, after China. Potatoes are the number one vegetable crop in the country, accounting for nearly a third of the total vegetable production. Apart from use as seed, almost all (95%) of potatoes are consumed fresh while the remaining 5% are processed as chips, fries, and other potato products (Reardon et al., 2012). In most parts of the country, potatoes are consumed as a vegetable accompanying rice or a wheat base, and have become an increasingly important source of dietary and culinary diversity throughout India.

With the growing predominance of marginal and small-scale farmers in the agricultural sector, including potato producers (NCEUS, 2008), and the growing dependence of these farmers on income from sale of their crops; there is great potential for potatoes in securing food and livelihood among poor households in rural communities. Such is the case in Meghalaya, India, a predominantly agricultural state where potato is an important crop in terms of both volume and value. In fact, the annual per capita availability of potato is more than four times the national average of about 18 kg.

Meghalaya is endowed with rich agricultural resources but still experience widespread poverty and slow rate of development. It is the second largest producer of potato in the North-Eastern Hill region, after Assam, in terms of cultivated area at about 18,000 to 20,000 ha. Potato here

Research Highlights:

- Potato is a vital and inseparable part of livelihoods and diets in Meghalaya and improvements in its value chain can benefit the entire sector, particularly smallholder potato farmers.
- Value chain mapping in three districts in Meghalaya revealed that farmers, traders, wholesalers, retailers, and consumers are the main value chain actors, supported by input suppliers and government organizations.
- The potato value chain can be strengthened by enhancing potato producers' access to inputs, better post-harvest handling, quality control mechanisms, and the use of proper storage.
- Potential interventions in potato marketing include providing market intelligence, building the entrepreneurial capacity of farmers, identifying processing options, and developing a branding strategy for Meghalaya potatoes to market to other states.

is cultivated under rainfed conditions, mainly in the hilly tracts of East Khasi Hills which accounts for two-thirds of the area of tuber crops. Meghalaya also has an advantage of being able to produce potato in the off-season in most areas, which allows producers to sell at premium prices, unlike other parts of India.

In spite of these, the average potato productivity in Meghalaya is less than half of the country average at around nine tons per hectare. Thus, Meghalaya is able to supply only less than 0.5% of the 44 million tons of potatoes produced in India. Low productivity of potato greatly affects farmers' incomes,

which they attribute to various production and marketing issues.

The root and tuber crops (RTC) Scoping Study conducted by the FoodSTART+ project in Meghalaya in early 2016 revealed that these issues primarily involve the lack of quality potato seeds of improved varieties, soil infertility and other environmental stresses such as climate change, absence of post-harvest processing, and inadequate transportation and storage of potatoes. Farmers also recognized that the lack of organized marketing and formal quality control as well as poor market infrastructure discourage farmers from marketing potatoes and other RTCs.

About FoodSTART+

Food Resilience Through Root and Tuber Crops in Upland and Coastal Communities of the Asia-Pacific (FoodSTART+) is a three-year project (2015-2018) that builds on and expands the scope of the concluded IFAD-supported Food Security Through Asian Root and Tuber Crops (FoodSTART) project. It is coordinated by the International Potato Center (CIP) and implemented in collaboration with the International Center for Tropical Agriculture (CIAT) in Asia. The project is also working closely with the CGIAR Research Program on Roots, Tubers and Bananas (RTB), and the CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS). It is funded by the International Fund for Agricultural Development (IFAD) and the European Union (EU).

The project aims to enhance food resilience among poor households in upland and coastal communities of the Asia-Pacific region through introducing root and tuber crops (RTCs) innovations. To achieve this goal at scale, the project develops, validates and implements effective partnership strategies with IFAD investment projects to promote RTCs for food security.

The project's key components are:

1. Project start-up and scoping studies including mapping on food vulnerability of RTC production and use;
2. Research for development (R4D) partnership development;
3. Needs and opportunities analysis on gender sensitive RTC innovations;
4. R4D action planning and launching; and
5. Documentation and knowledge products development.

The first series of the FoodSTART+ Research Briefs featured the results of the country scoping studies under Component 1. This second series presents the key findings and recommendations of in-depth studies conducted by the project under Component 3 to assess needs and opportunities on RTCs innovations. These studies were carried out in the first and second year of project implementation.



One of the key actions proposed by the said scoping study was to conduct a deeper assessment of the potato value chain in Meghalaya. In response to this recommendation, the authors conducted a study with the goal of characterizing the entire potato value chain in Meghalaya to be able to identify major constraints and areas where interventions could significantly increase returns for potato producers; including input supply, varietal distribution over seasons, production, processing, and marketing. This brief presents the highlights of this assessment.

Brown (2009) defined value chain as “the set of interconnected, value-creating activities undertaken by an enterprise or group of enterprises to develop, produce, deliver and maintain a product or service.” When a product moves from the producer to the consumer, value is added as several transformations and transactions take place along the chain of interrelated activities, hence, the term value chain is used to describe the product’s movement and interaction along this chain. Value chains adapt and respond to several factors, including local conditions, policy and institutional environment, market power and consumer preferences, among others.

Understanding the current potato production, marketing and utilization trends can help the IFAD-supported Livelihoods and Access to Markets Project (LAMP) of the Meghalaya Basin Development Authority (MBDA) in designing and implementing value-adding interventions for potato in the state. Moreover, a value chain assessment can help identify ways to improve the linkages between marginalized farmers and potato markets and increase efficiency in the potato value chain.

Methodology

A cross-sectional research design and the tools for value chain analysis recommended by Eman and Nigusie (2011) were used in this study to collect information from various stakeholders, including scientists, extension workers, traders, processors, farmers, seed producers and other persons or groups involved in the potato value chain in Meghalaya. Data was gathered through literature reviews, key informant interviews, focused group discussions, survey of respondents using questionnaires, stakeholders meetings, market visits, and observations. Primary data was collected on December 2016

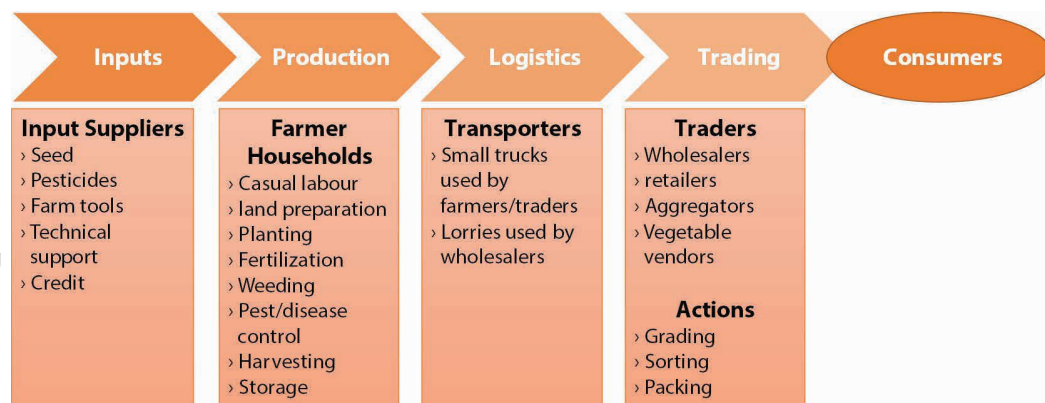


Figure 1. Potato value chain actors in Meghalaya.

to March 2017 by selected MBDA staff trained on conducting value chain assessments.

The survey questionnaires were designed for the different value chain actors including farmers, seed producers, aggregators, wholesalers, retailers, and consumers in the three selected districts in Meghalaya: East Khasi, West Khasi, West Garo. These districts were purposively sampled because they are the top districts in terms of both potato area and production. To date, East Khasi Hills District is well above all other districts in terms of both area and production, with West Khasi Hills in second and West Garo Hills in third. East Khasi Hills alone contributes to 64% and 67% of the total area and production in Meghalaya, respectively.

These three districts also represent all four potato cultivation seasons available in Meghalaya. Farmers in East and West Khasi Hills grow potato during summer and spring, which is the main potato cultivation season in Meghalaya, and in small proportions in autumn, while West Garo Hills farmers plant potato in winter.

Value Chain Mapping of Potato

Value chain mapping systematically maps the actors participating in the production, distribution, processing, marketing and consumption of a particular product or products. Moreover, it analyzes the characteristics of actors, profit, cost structures, and flow of goods throughout the chain; as well as employment characteristics and the destination and volumes of domestic and foreign sales. The following sections discuss the potato value chain map in Meghalaya.

Value chain actors. Value chain actors are those individuals who take ownership of a product, through the exchange of money or equivalent goods or services during the transaction process of moving the product from conception to the end user. The key potato value chain actors in Meghalaya are shown in Figure 1.

Study results revealed that potato production in Meghalaya is dominated by smallholder farmers (95%) with farm holdings of less than 2 ha. These farmers usually get inputs from local suppliers, although majority of East and West Khasi farmers produce their own tuber seeds. At the same time, transport of potatoes for selling are mostly done by farmers themselves or by wholesalers in some cases.

Trading or marketing of potatoes involves various value chain actors. They are led by traders usually found in the *lewduh* market, a non-regulated market in Shillong, and in the Mawiong regulated market. Traders purchase potatoes from farmers in relatively large quantities and sell them to wholesalers in the neighboring states of Assam, Tripura, Manipur, and Mizoram. There are also traders in Garo Hills who go to villages and purchase potatoes directly from farmers. Wholesalers also purchase potato in large volumes from farmers, traders, or aggregators and sell to retailers. They are mostly located in the neighboring states but are also present in Meghalaya markets, usually in *lewduh* and in West Garo District towns. Meanwhile, retailers purchase from wholesale traders and sell directly to consumers who are present in Meghalaya or neighboring states. They also purchase from farmers and sell to consumers. Aggregators are located in villages and purchase potatoes in small quantities from farmers, bulk them and sell to wholesalers. Lastly, vegetable vendors purchase potatoes from farmers and sell them in formal as well as roadside markets.

Majority of the potato produce in Khasi Hills is exported to neighboring states from May till December and imported from the plains during the rest of the year. The major local markets where potato is traded include the *lewduh* and Mawiong markets. In West Garo Hills, a small proportion is marketed in neighboring areas like the Tura and Phulbari markets.

Consequently, majority of Meghalaya potatoes are consumed outside

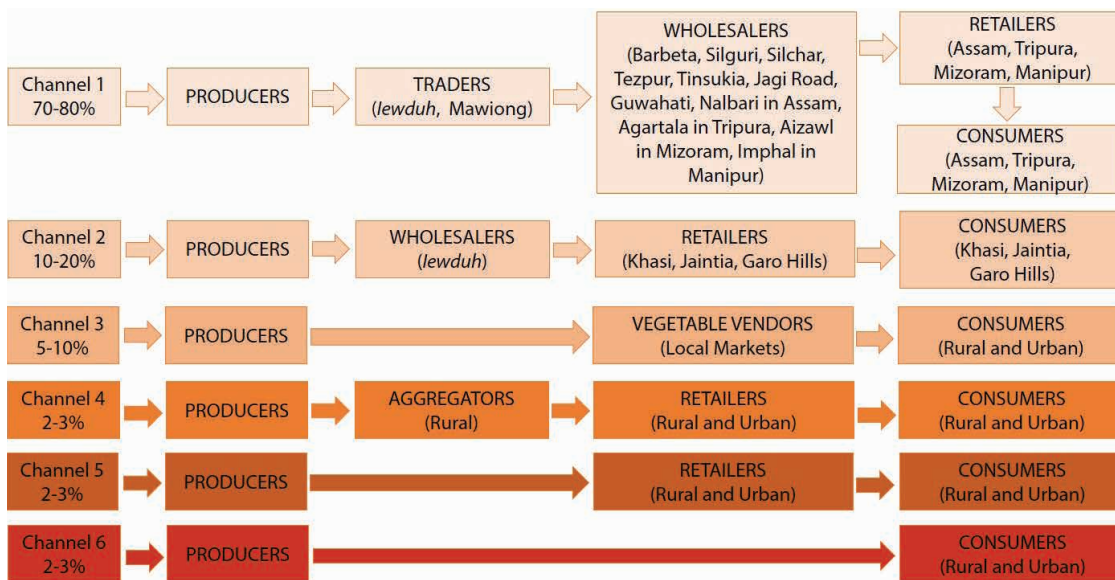


Figure 2. Potato value chain map for spring and summer potato in Khasi Hills.

the state with only 30% of potatoes produced in Meghalaya utilized for consumption within the state. Consumers of potato are usually rural and urban households, restaurants, hostels, hospitals, and other food outlets in the region.

Ware potato during spring and summer harvests in Khasi Hills. The assessment did not find major differences between the potato value chains in East and West Khasi districts for the spring and summer seasons, the main potato cultivation seasons in Meghalaya, thus, they are presented here as a single set of value chains, with several channels (Figure 2).

Channel 1. This is the largest channel which accounts for 70-80% of the total locally produced potato in Khasi Hills. In this channel, the *lewduh* market in Shillong and the Mawiong market are the aggregation point for the locally produced potato. The *lewduh* potato market, or big market in the local Khasi language, starts in May and ends in October with a peak period in June. This is where top grades of potato are mostly sold. There are about 100 male and female traders who buy the produce from the farmers through price bidding and then resell the potatoes to wholesale traders from the neighboring states of Assam, Tripura, Manipur, and Mizoram with representatives or agents in *lewduh*.

On the other hand, the Mawiong regulated market only has three traders and receives mostly the lower quality and ungraded potatoes. This market is active from June to December every year, trading produce

to neighboring states like Assam, Mizoram, and Manipur; while some goes to the Paltan bazaar in Shillong for the wholesale market. Unlike the auction system in *lewduh*, farmers find out the prevailing prices from traders before bringing the produce to the market.

Even though most farmers in Khasi Hills prefer to trade the better quality potatoes at *lewduh* for its convenient location, better price, and larger number of traders, the total amount of potatoes traded are higher in Mawiong than in *lewduh*.

Channel 2. This channel accounts for 10-20% of the local potato traded. Farmers still trade produce in *lewduh*, but this time they trade through the many wholesalers who trade potato to various parts of the Meghalaya state. The farmers usually discuss the price of the potato for the day over the phone before bringing or even harvesting their produce. These wholesalers, who are mostly non-local males, pay the farmers in cash or credit. The potato is then sold to retailers who come to *lewduh*.

Channel 3. This channel accounts for only 5-10% of potato traded, where farmers sell their produce in the local

markets through vegetable vendors. While the volume traded in these markets are small, there are hundreds of these traditional weekly or bi-weekly markets in the rural areas. In these markets the vendors are mostly women.

Channel 4. In this channel aggregators, mostly local men, collect potatoes from various farmers in the village or nearby areas and supply the potato to the traders in Mawiong

market. Some aggregators also supply wholesalers or traders in other markets like Ladrymbai, Guwahati, Jagi Road, among others.

Channel 5. Farmers sell their potato directly to the retailers in the markets like Mairang and Mawngap for subsequent sale to consumers.

Channel 6. In a limited number of cases, few consumers source their potatoes directly from farmers who they may know or have some link to.

Ware potato during winter harvest in Garo Hills. There are two main and two minor channels through which the winter potato harvest is marketed in Garo Hills, with Channel 1 and 2 equally accounting for 30-40% of the total amount of traded potato (Figure 3).

Channel 1. Most farmers sell their potato to traders who visit their villages and in turn sell to wholesalers in urban centers in Garo Hills, where retailers from Bhaitbari, Phulbari and Tura markets purchase the potatoes for sale to consumers. Usually the traders contact the wholesalers in advance and collect the produce either in a cart, mini-truck or bus.

Channel 2. Several farmers also sell their potato in the weekly local markets



Figure 3. Potato value chain map for winter potato in West Garo Hills.

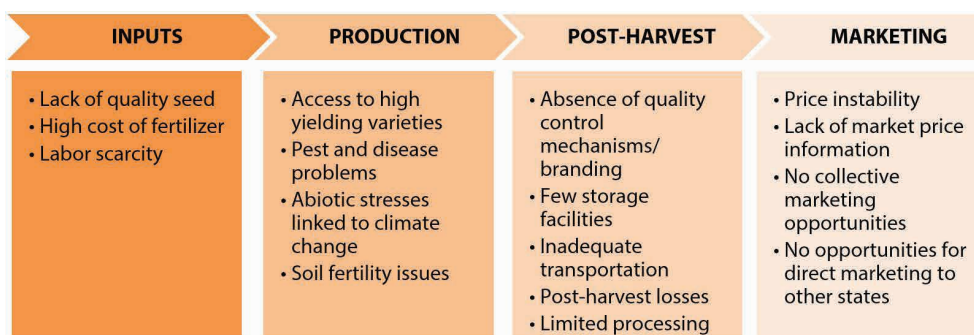


Figure 4. Major challenges in the potato value chain.

through vegetable vendors who move from one local market to another.

Channel 3. Some farmers sell their produce directly to local consumers.

Channel 4. In a few cases, farmers sell their potatoes to aggregators in the villages who, in turn, sells to retailers.

Value chain mapping revealed that the actors with the most influence on the potato value chain in Meghalaya are the wholesalers operating in neighboring states. They play a decisive role on how the chain operates since they determine the flow of commodities as well as prices. Through their vast networks, wholesalers have sufficient information about the supply of potato and which direction it flows along the marketing channels in different parts of the country, thus they are capable of setting potato prices. Farmers tend to accept these prices with hardly any negotiation due to fear of unsold produce and thus, do not have any significant influence on the value chain.

Furthermore, an analysis of the market margins along the different channels showed that the fewer the intermediate value chain actors are, the greater the benefits to both producers and consumers. Value addition is most significant among farmers than with intermediate actors who handle much larger volumes. Farmers' value addition activities include grading and taking the product to *lewduh* market while the intermediate actors' value addition involves simple product transport and interaction with other actors. Despite this, the great volumes handled by intermediate actors mean they still get higher profit margins than farmers.

Challenges and Opportunities in the Potato Value Chain

The key challenges experienced by the various potato value chain actors interviewed in this study are summarized in the figure above. Input related problems are primarily associated with the use of high quality seed materials of improved varieties. This is a multi-dimensional problem including the limited availability, delayed supply, lack of

new or appropriate varieties, and high costs of seeds. Other production problems include low soil fertility and environmental stresses related to climate change.

Susceptibility of current varieties to diseases and pests especially potato late blight are also a major concern for farmers. Notably, while the supply of the widely used Kufri Jyoti variety has improved overtime, in recent years its tolerance to late blight has broken down. An alternative variety that is appropriate for local conditions is Kufri Giriraj, but it is not yet included in formal seed multiplication schemes. At the same time, reduced soil fertility is worsened by increased fertilizer prices, largely due to the removal of subsidies on inorganic fertilizers. Farmers also identified the decreasing availability of timely labor as a growing problem.

In terms of post-harvest issues, value chain actors stated that the quality control of potato is mostly done through physical observations only and that there is no standardized potato quality control mechanism in the country whether in production, transportation, or in packaging. Modern branding practices are also not being used in the study area. There is opportunity for increasing market margins across the value chain if more value adding activities are undertaken, such as improved packaging or grading. Moreover, there is almost no processing of potato in Meghalaya and all types of modern processing units are absent.

Both farmers and traders expressed concerns about price instability and even price crashes that have occurred in the past, which led farmers to sell at a loss. Farmers also feel that the lack of information on market prices in other states, which have a considerable effect on potato prices in Shillong, is a significant constraint. Because they are not aware of the exact price at which they could sell their product before coming to *lewduh* market, farmers have no choice but to accept the price bids of traders. In addition, even though nearly 70% of potato production in Meghalaya is marketed to neighboring states, there is no formal mechanism

available for the farmers to directly sell their product to other states.

Standard affordable common storage facilities are also lacking while proper transportation options are also limited which increases post-harvest losses.

To overcome the challenges faced by actors in the potato value chain, especially for farmers, this study also identified opportunities for

intervention. These include options for increasing the supply of and farmers' access to high quality seed of modern varieties. The ware potato value chain could also be improved through better post-harvest handling, quality control mechanisms, and the use of proper storage. Opportunities for improved potato marketing includes providing market intelligence to farmers to help stabilize prices, building the marketing and entrepreneurial capacity of farmers, identifying processing options, and developing a branding strategy for Meghalaya potatoes to market to other states. All these can be done through better collaboration between farmers, other value chain actors, and government agencies.

The results of this study can be used by policy makers, researchers, and development organizations interested in the development of the potato value chain as a way to enhance the livelihood of small-scale farmers and other vulnerable stakeholders in Meghalaya.

Literature Cited

- Brown, W. G. 2009. Value Chains: Value streams, value nets, and value delivery chains. <http://www.bptrends.com>. Site visited on 12/9/2012.
- Emana, Bezabih and Nigusie, Mengistu. 2011. Potato Value Chain Analysis and Development in Ethiopia Case of Tigray and SNNP Regions. International Potato Center (CIP-Ethiopia).
- National Commission for Enterprises in the Unorganised Sector (NCEUS). 2008. National Sample Survey Land Holdings 8th, 17th, 26th, 37th, 48th, 55th Rounds, Central Statistical Organization, Government of India.
- Reardon, Thomas, Kevin Chen, Bart Minten, and Lourdes Adriano. 2012. The quiet revolution in staple food value chains: Enter the dragon, the elephant and the tiger. Mandaluyong City, Philippines: Asian Development Bank, 2012.

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